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Steam Fire Engine.

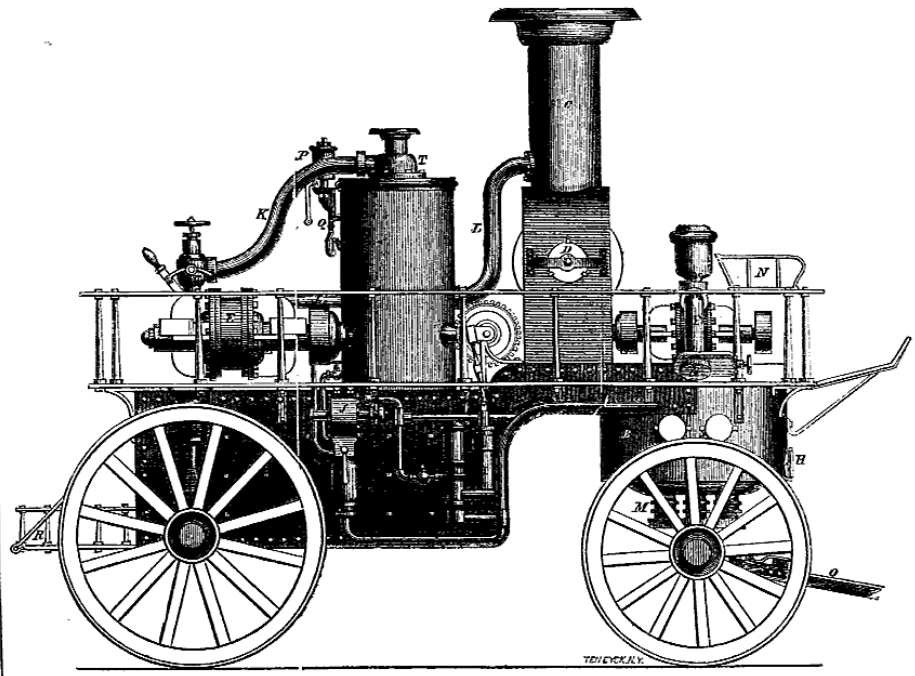
There are very few persons in a community who have not, more or less, partaken of the intense excitement and sympathy always consequent upon fires taking place in their midst; and it is not strange, therefore, that a large amount of thought should be expended toward their prevention and extinction. In view of their frequent occurrence in this country, and the vast amount of property annually destroyed in this manner, it becomes the duty of every good citizen to exercise his mind and skill, and endeavor to avert and remedy this terrible evil, and to encourage the efforts of others to these ends. Of late years the attention of inventors has been directed to the application of steam to the suction and forcing of water in fire engines; and many powerful fire engines worked exclusively by this force are in successful operation in many of our western cities.

Our engraving represents a side elevation of a compact form of steam fire engine, manufactured by Silsby, Mynderse & Co., which is a modification of the plan and arrangement of the parts of the one previously manufactured by them, and which was illustrated in No. 10, Vol. XII, SCIENTIFIC AMERICAN.

A represents the steam boiler, provided with three hundred 1¼ inch upright tubes, and connected to the supply water tank, B, by a suitable pipe. C is the smoke pipe, in the lower part of which is placed a blower or fan, D, which receives its motion by a band passing around a wheel on its shaft, and around another wheel, secured to one of the hind wheels. E is a rotary engine, constructed on the plan of Holly's patent, as shown in our former illustration. F is a rotary pump, also constructed after the plan of Holly's patent. G is a take-off for a hose for conducting water to the fire to be extinguished. H is a 4½ inch suction opening, for attachment of the suction pipe or hose usually carried with fire engines of this description. It can be used to draw water from cisterns, rivers, and other places, or attached to the ordinary hydrant. I is the pump for supplying the boiler with water, geared to and worked by the shaft on which the rotary engine, E, and rotary pump, F, are secured. J is a rotary donkey pump and engine combined, constructed and operating in every respect similar to the engine, E, and pump, F. This additional supply pump is for the purpose of supplying the boiler with water when the machine is not in operation, and cannot, therefore, receive a supply of water from the pump, I. K is the steam supply pipe. L is the exhaust steam pipe. M M are india rubber springs, on which the machine rests. N is the driver's seat. O is a tongue, to which the horses for drawing the machine are attached. This tongue is made to disconnect by means of a lever under the control of the driver. P is a steam whistle, Q a steam gage, and R the platform for firemen. S is the heater for feed or supply water. T is a safety valve, and U the throttle valve.

We think this a simple and convenient form of steam fire engine, and admirably adapted to the object for which it is designed. Its weight is from 4,500 to 5,000 pounds, with capacity to force two 1 inch streams 175 feet, or one 1½ inch stream the same distance; and

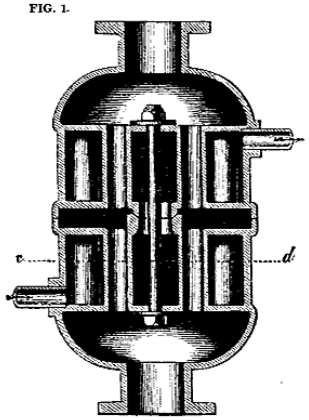
SILSBY, MYNDERSE & CO.'S STEAM FIRE ENGINE



the pressure of steam required to produce these effects will only range from 40 to 60 pounds per square inch. A working pressure of steam can be generated in the boiler in from eight to ten minutes, and this can be maintained constantly to force one or two streams of water of the sizes mentioned. Its main working parts are constructed under Birdsill Holly's patent, issued in 1855, by Messrs. Silsby, Mynderse & Co., Island Works, Seneca Falls, N. Y., who will furnish any additional information desired.

HOADLEY'S FEED-WATER HEATER FOR BOILERS.

FIG. 1.



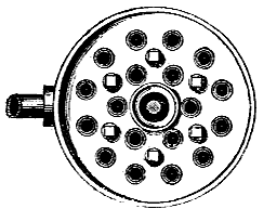
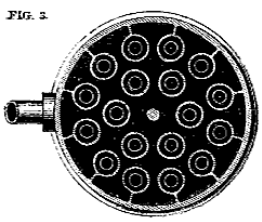


FIG. 2.



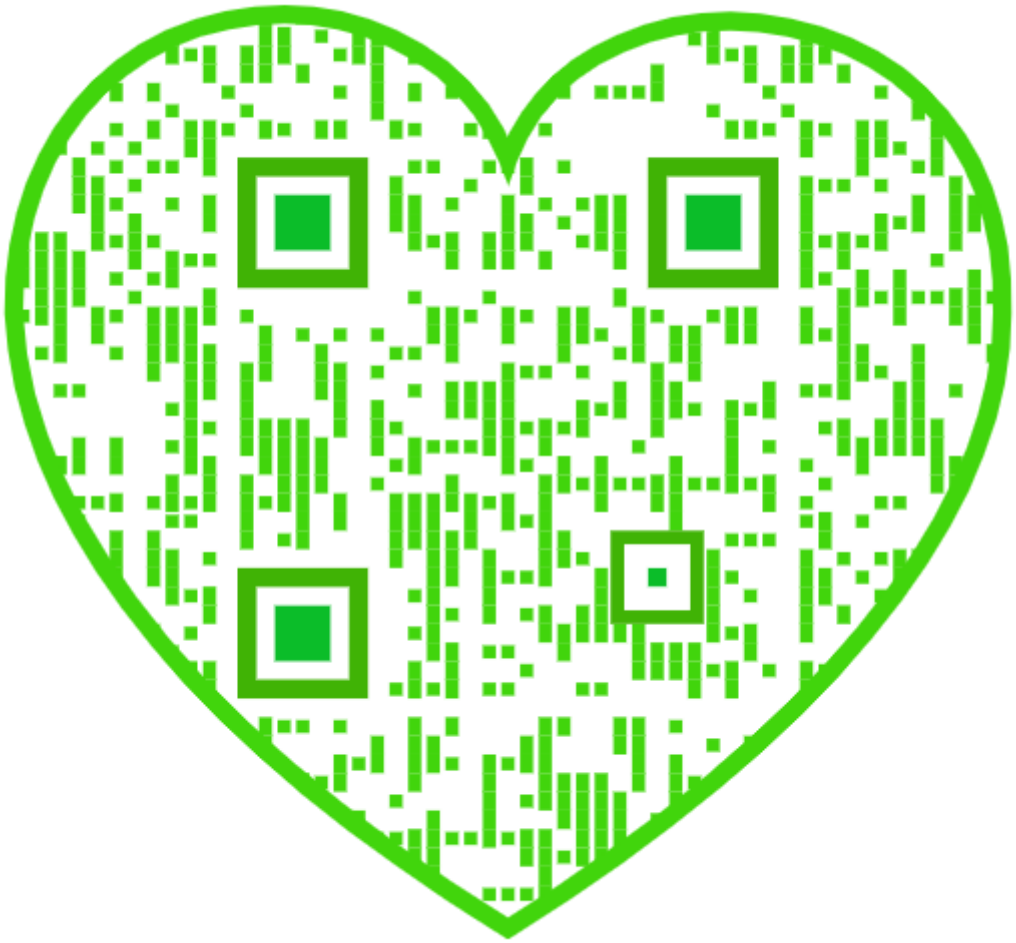
It is a well-known fact that a great saving is effected by conducting the exhaust steam of a steam engine through a feed-water heater after performing its function in the cylinder, and thus imparting through this agency a great portion of its heat to the cold water before it enters the boiler; and hence its follows that a heater, to be thoroughly effective, should be so constructed as to present as much surface as possible to the action of the steam, and contact of the supply water.

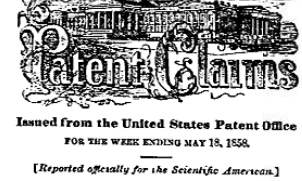
The accompanying engravings show an improved honey-comb heater, which accomplishes this desideratum in a marked degree, in which Fig. 1 represents a vertical section, Fig. 2 a top view of the under section, and Fig. 3 a horizontal section of the same at the dotted line, *c d*, of Fig. 1.

This heater receives its name on account of its resemblance to a honey-comb, and consists of two cylindrical sections containing a series of tubes cast with them, and communicating above and below, with spaces at the center part, where they are secured together by a screw bolt at the upper and lower ends of the heater, the spaces at these last mentioned parts being provided with nozzles for the entrance and exit of the exhaust steam to and therefrom. These tubes and spaces cause the steam to be displayed and brought in contact with a large area of heating surface, which receives a great portion of its heat, and in turn constantly imparts it to the supply water passing through the several water spaces between and around, and above and below the upright tubes and spaces, as it ascends after entering the lower part of the heater, through the horizontal pipe, and before it is discharged from the upper end through the corresponding pipe conducting it to the boiler in a heated state.

This multitubular heater differs from all others in use in being formed as described in the claim upon which the patent was issued, "with the tubes, tube sheet or heads, and case, all of one piece of metal, without joints uniting these parts." It is at once cheap, durable and efficient, characteristics which commend it to all owners of steam engines.

Further information may be had by addressing J. C. Hoadley, agent, Lawrence, Mass.





Issued from the United States Patent Office

FOR THE WEEK ENDING MAY 18, 1858.

[*Reported officially for the Scientific American.*]

FASTENING FOR HAME TUGS—J. E. Ball, of Newark, N. J. : I claim the combination of the loop, F, the dovetailed slide or key, F, the projection, i and i', and plate, c, arranged and operated in the manner and for the purpose substantially as shown and described.

METHOD OF OPENING AND CLOSING FARM GATES —Wm. F. C. Beattie, of Cornwall, N. Y. : I claim the combination of the handles, r r', with the latch, in the manner and for the purpose set forth.

FASTENING RAILROAD RAILS—S. A. Boys, of Kings County, N. Y. : I do not claim all the several parts or devices as set forth and described in the accompanying specification and drawing separately.

But I claim the use of a bolt or bolts, with nut key or clinch, in combination with, or as an improvement on the rail patented to me by Letters Patent, dated Oct. 27, 1857, the bolt passing directly through both rails horizontally, and into the form of the mortises separate or combined for the object and purpose set forth in the specification and claim, and for no other purpose, as by reference to the drawings will more fully appear.

MACHINERY FOR HULLING AND THRASHING CLOVER—J. C. Birdsell, of Rush, N. Y. : I claim the arrangement of the slatted belt, b b, with the bolt, B B', table, T, threshing cylinder, D, hulling cylinder, L, and fan, F, the whole operating in the manner and for the purpose substantially as set forth. It being understood that I claim the above described devices and arrangements only as applied to the construction of clover hulling machines.

MAKING SHOT—Alfred Booth, of New York City : I claim filling a chamber with spray and dropping melted lead through it to facilitate the cooling of the shot, constructed and arranged substantially as described.

REAPING AND MOWING MACHINES—J. W. Brokaw, (assignor to Warder, Brokaw and Child,) of Springfield, Ohio : I claim the construction and combination of the shell standard, B, and sliding boxes, D, when used in connection with a change of pinions and operating in relation thereto, in the manner and for the purposes set forth.

ESCAPEMENT FOR TIME KEEPERS—Samuel Carpenter, of Pinehurst, N. Y. : I do not claim the detent spring, D, as that is used in all chronometers.

But I claim, first, So constructing a scape wheel with two rims or rows of vertical teeth or their equivalent as to admit the instance or lower bearing of the staff which carries the pallets and balance to be placed between said rims or rows of teeth, for the purpose of giving double action to the pallets, by which means the watch is prevented from setting by a sudden jerk as a tooth of one or other of the rims will be acting on its corresponding pallet.

Second, I claim the pallets in combination with the wheel and detent spring, as specified.

CORN HUSKERS—Joseph Cawthra, of Rochester, N. Y. : I claim the inclined reciprocating husker, k, constructed as described, in combination with stationary teeth, l, the inclined curved grate, Y, and the slide, G, when these several parts are constructed, arranged and operated substantially as and for the purposes set forth.

RAILROAD CARS FOR DAY AND NIGHT SERVICE—J. R. Creighton, of Tiffin, Ohio : I claim, first, The formation of car beds by means of the stationary seats and movable backs as now in use, in combination with the slotted supporters, A, stops, i, irons, l, stretching sheets, B, eccentrics, U, and reversible hooks, x, arranged and operated substantially as set forth.

Second, The described method of forming and concealing when not in use in the spaces between the windows an upper tier of beds, as set forth and for the purpose specified, and also the same in combination with the devices constituting the subject of the first claim.

ELECTRIC LAMP—H. M. Collier, of Binghamton, N. Y., and H. N. Baker, of New York City : We do not claim the feeding together of the electrodes in an electric lamp by means of floats, springs or other mechanical appliances, nor the mechanical pole changer as heretofore used, but only as applied to an electric lamp in the manner described.

But we claim the employment in an electric lamp of an open seat, i, contained in a stationary bridge plate, c, or its equivalent, and receiving the electrode in such a manner as to allow the point only thereof to protrude through it the distance required, and permitting the advance of the said point so fast only as it is consumed and reduced by the electric current, substantially as described.

We also claim the combination of the loaded tube, b, carrying the upper electrode e, the open seat, i, and the mercury tube, f, in which floats and is secured the lower electrode, e', substantially as described, so that while the upper tube, b, feeds the upper electrode down to the open seat as fast as it is reduced, the lower electrode, e', is also fed up as fast as reduced, and kept in its proper position with reference to the upper electrode, e.

[See description of this invention on another page.]

BALLOT BOXES—Allan Cummings, of New York City: I claim the peculiar formed cover or top combining the glass plate a, transparent tube, C', and the wire screens constituting the sides, all for the purpose and substantially in the manner described.

HORSE POWERS—Jeremiah Darling, of Cincinnati, Ohio : I claim the independent and endless series of friction rollers above described, in combination with the double flanged track, r, and the peculiarly constructed endless apron, R, for the purpose of preventing friction and for increasing the efficiency of the horse power substantially as set forth.

MEAT CHOPPER—L. A. Dole, of Salem, Ohio : I claim the arrangement of the horizontally slotted reciprocating vertical knife shaft, c f F, grooved ways, c c, horizontal crank shaft, G, g, and central guide tube, d, for use in combination with the following arrangement of gearing, consisting of the toothed rim, H, on the bottom of the tub, loose pinion, k, gearing in the same, loose and fast pinions, J L, arranged on the stationary axis, I, of the large driving pinion, J, and two small pinions, P N, which are arranged on a shaft, O, passing through the face of said driving pinion, J, and have an independent motion of the pinion, while they also move round a common stationary axis, and are actuated by the same crank or belt, substantially as and for the purposes set forth.

[This machine consists of a circular and revolving tub mounted on legs. Two knives vibrate up and down in said tub, and mince the meat perfectly. The tub has a very slow circular motion imparted to it by a peculiar system of gearing, while the knives have a rapid up and down movement by means of a crank shaft. The machine, as a whole, is very compact and effective in its operation.]

CULTIVATORS—John Endsley and Elihu Fletcher, of Abington, Ind. : We do not claim a bed with inclined sides following the truce of the colter rendering the sides of the furrows compact, and preventing the falling in of the earth, as described in Charles K. Farr's patent of May 9, 1854. Neither do we broadly claim the saddle I, as we propose making that the subject of a separate application.

But we claim the arrangement of shanks, D E F, and shovels, G G' G", with saddle, I I, and beam, A, when constructed in the manner and for the purposes shown.

BARREL-HEAD MACHINE—Benjamin Fitch, of Moores, N. Y. : I claim, first, The combination of the frame, F, and the plane stocks, U U', operated by the movement of the handle, Q, as and for the purposes set forth.

Second, The combination of the friction band, K, with the swinging platform, V, operated at one and the same time through the handle, L, in the manner and for the purposes set forth.

Third, Retaining the spring catch, a, from the arm, s, to allow the frame, F, to return to its first position after the saw, O, has effected its purpose by the lever, b, acting upon the stop, c, as described.

CARD PLATES FOR TRUNKS—Joseph Dudley, of Fall River, Mass. : I claim the frame, A, provided with transverse bars, B C C, and an elastic plate, D, the frame being secured to the trunk, and the whole arranged substantially as and for the purpose set forth.

[This device consists in a metallic frame having a transverse central crosspiece and two transverse end pieces, and a spring or elastic plate placed on the central crosspiece, its ends being underneath the end pieces and used in connection with it to secure the cards in the frame which is placed on the trunk.]

PENCIL SHARPENERS—Walter K. Foster, of Bangor, Me.: I claim making the pencil sharpener with a space, c, or its equivalent, as arranged beyond the inner end of the blade, C, as to cause the pencil lead to be turned or reduced cylindrically while passing beyond the inner or upper end of the knife.

I also claim the arrangement of the space, c, with reference to the handle, that is, so as to be separated therefrom or not open into the space or opening, f thereof, the same being for the purpose as set forth.

I also claim making the body, A, of the pencil sharpener with a light port or opening, i, arranged opposite to the chip throat, and for the purpose described.

I also claim arranging the auxiliary chamber, c, or its side, h, with respect to the conical chamber, a, so that while the lead is being cut by the knife, the lead may not touch the side of the auxiliary chamber or be so near it as to be ground or injured by particles of lead which may adhere to the sides of the auxiliary chamber.

WOVEN TUCKED FABRICS—Thomas France, of New York City : I claim the tucked fabric produced entirely by weaving, in the manner substantially as set forth.

[This is an entirely new product of the loom. By it a perfect tuck is woven in the fabric of the same thickness, and with little trouble. It is especially applicable for ladies' bustles or skirts, and the inventor calls it "bustle cloth."]

RAILROAD CAR COUPLINGS—F. E. Gleason, of Columbus, Ohio : I claim the arrangement and construction of the catch, E, with relation to the bar, c, and this in combination with the foot piece, C, bars or rods, a a, spring, D, and link, B, all being operated in the manner and for the purposes set forth.

COOKING STOVES—R. D. Granger, of Philadelphia, Pa. : I claim, first, Combining an oven, constructed of burnt fine clay, or other equivalent material capable of absorbing and retaining heat, with an ordinary cooking stove, in such a manner that the products of combustion may pass either around or through the interior of the oven for the purpose specified.

Second, The arrangement of the annular perforated tube, M, and its air-pipe, N, with the lining, G, the same being arranged substantially as and for the purpose set forth.

CORN SHELLERS—Ray Green, of Cussewago, Pa. : I claim the shelling cylinder B, constructed as described, revolving within the feeding cylinder, in combination with the feed regulating slide, J, concave, T T, and springs, R, fingers, I, discharging apron, H, and spout, N, when the several parts are constructed, relatively arranged, and operated in the manner and for the purposes set forth.

THICK WOVEN FABRICS—John Gujer, of Philadelphia, Pa.: I claim the manufacture of stout textile fabrics for the purposes above named, of considerable thickness, in which all the warp threads are interwoven with the filling threads, substantially in the manner described.

FORMING THE HEADS OF CARRIAGE SPRINGS—Samuel H. Hartman, of Pittsburg, Pa. : I claim forming the head or socket on the upper plate of a spring, by subjecting them to the action of the dies and counter dies in the die blocks, F F' F", and the levers, G G' G", in the order of their sequence, substantially as represented and described.

PLOWS—John M. Hall, of Warrenton, Ga. : I claim the construction, arrangement, and combination of the body of the implement and its movable parts described, whereby it is readily adapted to properly receive in turn, the several parts employed for performing the various modes of cultivation specified.

MACHINES FOR CLEANING COTTON—Thomas Oliver, of Yazoo City, Miss. : I claim the arrangement of the toothed rollers, a b c d, and e, the guides h, and G, and toothed carrying apron, F, constructed and operating together in the manner and for the purpose specified.

[This invention consists in the employment of a series of toothed rollers and a fan so arranged that the cotton is loosened and its fibers separated one from the other, so as to "lighten up" the mass and detach or loosen the dirt and other foreign substances from it. The cotton being discharged in a thin layer or sheet, so as to be effectually operated upon by a blast generated by the fan, the blast separating the dust and other light impurities from the cotton. The invention also consists in using in connection with the toothed rollers and fan, a toothed endless apron arranged relatively with a guide board, whereby husks and other foreign substances, which the cotton may contain, and which are too heavy to be acted upon by the blast are separated from the cotton.]

HARVESTERS—Martin Hallenbeck, of Albany, N. Y. : I claim the tail bar, C, hinged to the bar, A, as described, and having the supporting wheel, V, at its rear end, in combination with the lever Y, for adjusting the inclination of the cutters, when these several parts are constructed, arranged and operated in the manner and for the purpose set forth.

HARVESTERS—Martin Hallenbeck, of Albany, N. Y. : I claim the coupling bars, m, as described and for the purposes set forth, the cutting plate, D, the lever, I, of the heel bar, in combination with the separate guide caps and coupling bars. The above improvements I claim substantially as described, and for the purposes set forth in the specification.

SIGNS—James Harrison, of Albany, N. Y. : I claim the construction of block letters, figures, and other devices, with an interstitial surface of carved ornamental work with which a colored or illuminated back ground may be employed, for rendering signs clearly perceptible at a great distance when viewed obliquely, substantially as set forth.

BLOCK FOR REPAIRING T-RAILS—Sanford Mason and E. M. Davis, of Michigan City, Ind. : We claim the method by which we combine the clamps, B B, with the bed piece or main block, A A, by means of the studs or trunnions, c c, and the concentric bearings, D E and and E D, substantially as described.

STOVES—Joseph C. Henderson, of Albany, N. Y. : I claim the chamber, G, contracted at the top, so as to produce and maintain while in action a plenum within the combustion chamber, when used in combination with the exterior chamber and connected by partition, D D, as described, for the purpose of preventing the escape of the volatile combustible from the combustion chamber, before its combustion is consummated.

REAPING AND MOWING MACHINES—Charles Howell, of Cleveland, Ohio : I claim connecting the outer end of the finger bar, A, with the gear block, C, by means of a curved bar, B, constructed in the manner substantially as and for the purposes set forth, whether it forms a prolongation of the gear block or otherwise.

PRESSES FOR ZINCOGRAPHIC PRINTING—G. H. Korff, of Hoboken, N. J. : I claim, first, The cylinder, B, in combination with the inking rollers, J J', and moistening rollers, K K', when arranged as shown, namely, the rollers, J K, having their bearings connected with rods, L, and used in connection with the adjustable rings, L', so that either of the rollers, J K, may be moved out free from the cylinder, B, or all moved simultaneously as may be desired.

Second, In combination with the cylinder, B, and rollers, J J', K K', I claim the pressure rollers, C D, in connection with the bars, E E, and shaft, F, provided with projections, 11, for the purpose of producing the "bite," or subjecting the paper to the proper pressure between the cylinder, B, and roller, C.

Third, The feed rollers, F H, fitted in elastic bearings, G o, and arranged relatively with each other, the pressure roller, C, feed board, M, and cylinder, B, as described, whereby with the aid of the curved rods, N, on the cylinder, B, the blank sheets are fed between the cylinder, B, and roller, C.

Fourth, I claim the peculiar construction of the cylinder, B, and rollers, J J', K K, as shown and described, viz., having plaster of Paris, d, molded around tubes, e, so as to obtain the necessary strength and inflexibility, with a requisite degree of lightness.

[See description in another column.]

MACHINES FOR GRINDING AND SIZING PAPER PULP—Joseph Jordan, Jr., of East Hartford, Conn., and Thos. Eustice, of Hartford, Conn. : We claim as our improved machine for the manufacture and sizing of pulp, that is as constructed of a single conical grinder and outer shell and with pipes for the introduction of the rags and the size, and the eduction of both arranged with reference to the axis and ends of the grinder, substantially in manner, and so as to enable the grinder to operate to reduce the rags to pulp and mix the sizing therewith, as explained.

HAME TUG FASTENER—E. D. Lockwood, of Churchville, N. Y. : I do not claim, broadly, the fastening of hame tugs by means of revolving studs or buttons.

But what I claim is connecting the hame tug to the tongue, t, by means of a joint, c, so that any strain upon the tug will tend to turn and lock the stud or pin, P, thus rendering the contrivance self-fastening substantially as and for the purposes set forth.

[A notice of this improvement will be found in another column.]

HORSE POWERS—R. F. Love and J. H. Frazee, of Shelbyville, Ind. : We do not claim the tread wheel, friction wheel, or fly wheel, knowing that they have been used.

But we claim the friction wheel, C, and fly-wheel, F, in combination with spring, F, lever, g, and levers, i i, on the ends of shafts, H H, for the purposes set forth.

SAFETY DROP FOR KEYS—R. K. Lee, of Brooklyn, N. Y. : I claim the revolving disk, 6, on the rear side of the notched drop, b, for the purposes and as specified.

I also claim the employment of the notched drop, b, the eccentric, f, and disk, 6, arranged, constructed and operating as specified.

TOOTHED CYLINDERS FOR GRINDING—Benj. Mackerley, of New Watersburg, Ohio : I claim producing a new manufacture in the shape of an improved toothed cylinder, by combining a properly perforated tube, a, with a series of teeth, b b, and the journal pieces, c c, in substantially the manner set forth.

VAPOR LAMPS—H. N. Macomber, of Lynn, Mass. : I am aware of the devices represented in Letters Patent of the United States dated May 10, 1844, and numbered 3,582, and therefore I do not claim the same. But I claim making the ascending and descending air passage of the lamp of a series of chambers each connected with the other, and the whole opening out of and into the reservoir of the lamp substantially as set forth.

SPRING ROCKING CRADLE—J. B. Malbert and Auguste Cheviron, of St. Louis, Mo. : We do not claim, broadly, the application of machinery to the column or frame of the cradle, neither do we claim the double escapement (which consists of the beams, X X, the pallets, B B, and the springs, c c) as such.

But we claim the arrangement of this double escapement with the escape wheel, D, in the manner described, the wheel being operated by the described combination of wheels and springs in the manner set forth.

MACHINES FOR APPLYING COP TUBES TO SPINDLES—John Maitland, of Lawrence, Mass. : I claim the machine for putting cop tubes upon spindles, operating in the manner substantially as set forth.

FILE MACHINES—F. M. Maltice, of Buffalo, N. Y. : I claim the cut-off valve, O, the lever, Q, cam, S, plunger H, chest, F, and cams, I and K, when arranged and operating in conjunction, for the purpose of opening and closing the passage, P, while filling the chest, and discharging the contents of the same by the openings, G G, in the manner and for the purpose specified.

MACHINE FOR WORMING, PARCELING, AND SERVING THE RIGGING OF VESSELS—Patrick McLaughlin, of Camden, Me. : I claim the described machine, consisting of an arrangement of devices for worming, parceling, and serving rope, in combination with suitable devices for holding and straining the same, operating in the manner substantially as described.

MILL FOR TREATING CHINESE SUGAR CANE—Henry Meyer, of Bridgeton, N. J. : I do not claim, separately, the expanding strippers, the system of rollers, or the revolving knife, as each of these devices have been used in other machines.

But I claim, first, The arrangement, substantially as described, of the rollers, H I and J, the strips, a f and b, and the revolving cutter, n, for the purpose specified.

Second, The expanding strippers, U, in combination with the rollers, H I and J, the same being arranged in relation to each other, as and for the purpose set forth.

AEROVAPOR BURNERS FOR LAMPS—Oscar F. Morrill, of Boston, Mass. : I claim the arrangement and application of the heating tube, E, with the wick holder or vaporizer, provided with one or more heat conductors, or equivalent devices, the same being to enable the production of vapor to be regulated in manner and conducted into the mixer, as specified.

I also claim the mode of applying the rod of the wick tube slider to the generator, viz., by carrying it through a tube extending through the reservoir of the generator, as set forth.

MACHINE FOR AFFIXING POST OFFICE STAMPS TO LETTERS—George K. Snow, of Watertown, Mass. : I claim the combination of feeding mechanism, shearing or cutting mechanism, a platen and bed applied together, so as to constitute a machine for affixing postage stamps to letters, substantially as described.

I also claim the arrangement of the feeding mechanism, the platen and the shears or shears, with respect to the lever and the bed, substantially as specified, whereby the reciprocating motions of the lever results will take place as set forth.

I also claim the gears, D, in combination with the bed, or the table, and the post stamping mechanism.

I also claim combining with the post stamping apparatus, or in one frame with it, a means of damping or wetting the surface or that part of a letter on which a stamp is to be affixed, as described.

CHASING MILL—Charles Moore, of Trenton, N. J. : I claim making a chasing mill self-feeding, automatically and continuously, by means of one or more circular troughs, which receive the substances to be ground or acted upon, and deliver them through spouts on to the bed of the mill under the chasing wheels, substantially as described.

I claim the scraper, I, so constructed and operated as to separate that portion of the material on the bed of the mill which is ground most, automatically and continuously, from that which is ground less, and deliver it to the discharge opening in the bed of the mill, substantially as described.

And in combination with a continuous automatic self-feeding apparatus, or a continuous automatic self-delivering apparatus applied to a chasing mill, I claim a heated bed, so as to heat, grind, mull and mix the materials supplied to the mill automotically, or without manual labor, at one and the same time, as described.

MANUFACTURE OF METALLIC ZINC—Alfred Monnier, of Camden, N. J. : I claim the process of obtaining metallic zinc from its ores by means of the combined metallurgic operations, substantially as described.

METHOD OF FEEDING THE BOLT IN LATH MACHINES —James Nevison, of Morgan, Ohio : I claim the wedge rack, D, riding on an inclined plane, D', in combination with the arms, G, provided with the spur wheel, F, ratchet wheel, I, and ratchet, J, for the purpose of elevating the log and giving it a throw, and also for holding it in place during the stroke of the knives, when arranged and operated substantially as set forth.

SAFETY ATTACHMENT FOR RAILROAD CARS—H. A. Newhall, of Newton, Mass. : I am aware that sliding platforms have been applied to cars; and I do not claim, separately and broadly, such device, irrespective of construction, and their connection with proper side guards.

But I claim the supplementary platforms or threads, formed of the rods, E, fitted in tubes, C, attached to the platforms, the rods bearing against springs, a, in the tubes, in combination with the side guards formed of the vertical rods, F, attached to the bars, b, and the chains, G, which are connected to the rods, F, and the railing or guards, H, of the platforms, the whole being arranged substantially as and for the purpose set forth.

[This invention consists in the employment of supplementary yielding platforms or treads, constructed in a peculiar way, and used in connection with side guards, these parts being so arranged that they may be applied to the cars, and afford perfect protection to passengers in passing from one car to another, while the same are in motion.]

PREPARATION OF FIBER FOR PAPER PULP—Martin Nixon, of Philadelphia, Pa. : I am aware that a process has existed whereby the alkaline solution is, by the agency of steam, heated in a separate vessel, and delivered on top of the straw in intermittent showers. This I do not claim.

Neither do I claim any process in which cutting of the straw is a pre-requisite.

But I claim, first, The described manner of applying the steam, whereby the solution is automatically and continuously delivered on top of the straw, as set forth.

Second, The process of boiling whole straw by the combined action of an upward current of steam and a downward current of alkaline solution, permeating the mass, and acting upon it in conjunction, substantially in the manner and for the purpose explained.

DEVICE FOR SLICING APPLES—H. and J. S. B. Norton, of Farmington, Me. : We do not claim, separately, any of the parts described.

But we claim the combination of reciprocating frame D, provided with the knives, d, and pressure bar, E, with the intermittingly rotating ratchet, G, the whole being arranged to operate as and for the purpose set forth.

In this apparatus, a reciprocating frame provided with knives, a pressure bar, and a rotating fork or arbor is used, for the purpose of slicing vegetables with great rapidity and facility.]

BURNERS FOR VAPOR LAMPS—John K. O'Neal, of Kingston, N. Y. : I claim the arrangement of the burner beneath the vaporizing tube or chamber, in such a manner as to be movable or adjustable to different distances therefrom, whereby the amount of light produced, and of vapor generated, may be exactly and in all degrees regulated simultaneously, and be mutually dependant on each other, in the manner specified.

CORN PLANTERS—L. B. Phelps, of Geneva, Ohio, I do not claim to be the inventor of runners, handles, seed boxes, or furrow openers or drills—these are old devices, and in common use.

But I claim the arrangement of the adjustable furrow openers, c c, handles, f e, lever, k, and spring catches, y y, with runners, a a, the whole being constructed for joint operation as described and shown.

LATHE DOG—Nathan M. Phillips, of New York City : I do not claim, broadly, making the hole in a lathe dog in which the article to be turned is placed, adjustable to fit, receive, and hold different sized articles.

But I claim the lathe dog described, having its body formed of one piece, and having an aperture, E, in which the follower, G, operates, in the manner and for the purposes set forth.

MANUFACTURE OF ARTIFICIAL WHALEBONE—C. Poppenhusen, of New York City : I do not claim saturating rattan with drying materials or with boiled linseed oil, as these processes have before been practised.

But I claim in the preparation of rattan subjecting it to mechanical pressure after it has been saturated with linseed oil or equivalent substance, and whilst the oil, or other equivalent saturating substance, is in the vesicid state, substantially as described.

APPARATUS FOR CLEANING THE COLTERS OF PLOWS —Abner Reeder, of Wrightstown, Pa. : Without claiming broadly an apparatus under the control of the plowman, for clearing the colter of plows, or the employment of a spring in connection with such apparatus, I claim the spring sliding rod, E, with any convenient number of prongs, when connected to, and arranged on, the plow, as and for the purpose set forth.

SEEDING MACHINES—Luther Robinson, of Melrose, Mass. : I claim the perforated reciprocating slide, K, in combination with the supplementary or auxiliary perforated slides, h h i i, one or more pairs, operated substantially as shown, for the purpose set forth.

[In this machine a novel means is employed for distributing the seed, and also a peculiar device for elevating the conveying tubes and shares, when the distributing is not intended to be used, as, for instance, when the machine is being drawn from place to place, or in turning the ends of rows. The invention is chiefly designed for planting seed in hills and in check rows, and at the same time to distribute, at the time of planting, a fertilizing material in the hills with the seed, the whole being so arranged as to ensure the perfect distribution of the seed and fertilizing material, and to place the machine under the complete control of the attendant or driver. There are also drag chains, to enable the driver to plant in parallel rows.]

STREET-SWEEPING MACHINES—Andrew J. Roberts, of Boston, Mass. : I claim, first, Hanging the brooms or brushes in a swinging frame on centers, so arranged that it can be readily leveled and adjusted as fast as the brooms become worn, as described.

Second, The combination of devices whereby the brooms are raised or lowered, and at the same time the communication between the driving power and brooms established or cut off, the same consisting of the bent lever arm, u n n, short arms, s s, and pulleys, i i, substantially as described.

Third, I claim attaching the spring plates to a swinging movable frame, which is raised and lowered

with the brooms, as described, whereby the said springs are raised from the ground when the brooms are not in use, and adapt themselves closely to the surface of the ground, and press against the same when the brooms are at work, thereby preventing, by the weight of the brooms, acting upon the springs, the vibrating or "bobbing" motion, which otherwise the brooms would receive.

Fourth, In combination with the stud, W W, in the driving wheels, the circular grooved pulleys, as set forth.

APPARATUS FOR BAKING AND COOKING—Willard G. Ruggles, of Worcester, Mass.: I claim the arrangement of the flue or flues with the slides and openings, when constructed as described.

DEVICES FOR REGULATING, BY ELECTRICITY, THE ISSUE OF GAS FROM BURNERS—Charles W. Smith, of Evans, N. Y.: I wish it to be understood that I do not claim the use of the attraction and repulsion of temporary and permanent magnets to obtain an increased for actuating the supply cock.

Neither do I claim the use of a pawl and ratchet, or their equivalents, for the purpose of controlling the supply of gas, and consequently the size of the flame.

But I claim the combination and use of a permanent and temporary magnet, or of two temporary magnets, one fixed and one vibrating, with a pawl and ratchet, situated substantially as described, upon the supply cock of a gas burner, or series of burners.

I claim also the use of a thin slip of metal, or its equivalent, to deflect a portion of the jet of gas upon an ignited platina coil, situated entirely without the jet, as described.

SELF-LIGHTING AND EXTINGUISHING LANTERNS—Adolph Roesler and Charles Frey, of Warsaw, Ill.: We claim, first, the box, C, provided with spring, d, as shown, plates, L, springs, i i, and arms, E E.

Second, We do not claim the slide, f, separately.

But we claim the slide, F, rods, k k and g, in combination with arms, E E, substantially arranged as described.

Third, We do not claim the extinguisher, p, separately.

But we claim the supporters, R R, plates, T and U, catch, s, rod, q, in combination with the extinguisher, p, the whole being arranged as described, and for the purposes specified.

BOOT JACK—Orson S. Sikes, of Suffield, Conn.: I claim the arrangement of the clamps, B, spring, D, pins F, operating in the manner and for the purpose described.

MOLDING FRAME FOR THE CONSTRUCTION OF BOATS—Nathan Thompson, Jr., of Brooklyn, N. Y.: I claim a frame, substantially as described, capable of supporting and confining in proper relative position the various parts that make up the frame of a boat, substantially in the manner specified.

And in combination with such a frame, I claim means substantially such as specified, for holding the frame in proper necessary positions, and admitting of an easy change from one position to another.

And also in combination with such a frame, lifting screws passing through the gunwale frame, substantially in the manner and for the purpose described.

TIPS FOR FISHING RODS—J. C. Underwood and T. J. Bargis, of Richmond, Ind.: We claim attaching the pulley, d, to the top, A, of the rod, through the medium of the socket, B, or its equivalent, so arranged that the pulley, d, is prevented from turning entirely around the tip, and the line thereby prevented from winding around the rod, and at the same time the pulley allowed to adjust itself so that the plane of its rotation may at all times be made to coincide with that of the line, e, substantially as and for the purpose set forth.

[Fishing rods would scarcely seem to afford much room for invention, but the above is a really valuable addition; it diminishes the friction usually attendant on "running out" and "drawing in," when a reel is employed, by having a small pulley at the tip, which adjusts itself to the line, and also prevents the line winding around the rod.]

GRINDING MILLS—S. Vascow and A. Guirand, of Cincinnati, Ohio: We claim the combined arrangement of the breaking rollers, c' c', with the cylindrical grinder, B, and concave, C C, when the whole is constructed as described, for adjusting the cylinder and concave apart, as described, for grinding.

SECURING METALLIC BANDS ON COTTON BALES—P. C. Ingersoll, (assignor to himself and H. F. Dougherty,) of Green Point, N. Y.: I claim the batten, B, pivoted to the plate, A, provided with openings, a a, the button, B, being provided with recesses, c, at its ends, and the whole arranged as and for the purpose specified.

[This invention consists in having a metal plate provided at each end with an opening or recess, through which the two ends of the hoop pass, and having a batten riveted to the outer side of the plate, this batten being recessed at its outer ends on its face side, to receive the ends of the hoop, which are bent so as to pass into these recesses, and so keep the hoop from moving. The batten also forms a secure lock.]

NAIL MACHINE—J. L. Krauser, of Reading, Pa., (assignor to himself and J. Harper, of Philadelphia, Pa.): I claim, first, Forming a groove or grooves in the anvil cutter to receive the flange or flanges on the nail plates, as set forth.

I also claim, in combination with a vibrating anvil or anvil cutter, the placing of the cutting edge of said cutter at or near the center of motion of said vibration, in the manner and for the purpose set forth.

I also claim the rims, or adjustable sections, B, on the perimeter of the rotating cutter wheel, C, for regulating the size of the nail to be cut, as set forth.

I also claim, in combination with a rotating cutter wheel and a vibrating anvil, the inclination given to said anvil and its cutter, for the purposes stated.

DEVICES ATTACHED TO HAND SAWS FOR SQUARING AND MARKING—Hiram Smith, of Camden, N. J., (assignor to Henry Disston, of Philadelphia, Pa.): I do not desire to claim the graduating of a saw blade, so that it may serve the purpose of a rule.

Neither do I claim, broadly, so constructing a saw as to answer the purposes of both a hand saw and square in one and the same instrument.

But I claim an improvement on the combined hand saw and square for which a patent was granted to Jackson Gorham on the 12th of May, 1856.

First, Riveting the shoulder strips, C C, directly to the blade, and independent of the handle, for the purpose specified.

Second, The combination of the sharpened projection e, with the graduated saw blade, as and for the purpose set forth.

RE-ISSUES.

MANUFACTURE OF INDIA RUBBER—Henry B. Goodyear, of New York City, (administrator of the estate of Nelson Goodyear, deceased, late of said New York.) Patented May 6, 1851: I claim the combining of sulphur and in ia rubber, or other vulcanizable gum, in proportions substantially as specified, when the same is subjected to a high degree of heat, substantially as specified, according to the vulcanizing process of Charles Goodyear, for the purpose of producing a substance or manufacture possessing the properties or qualities substantially such as described, and this I claim, whether the said compound of sulphur and gum be or be not mixed with the other ingredients, as set forth.

MANUFACTURE OF INDIA RUBBER—Henry B. Goodyear, of New York City, (administrator of the estate of Nelson Goodyear, deceased, late of said New York). Patented May 6, 1851: I claim as the invention of the said Nelson Goodyear, deceased, the new manufacture or substance described, and possessing the substantial properties described, and composed of India rubber, or other vulcanizable gum, and sulphur, in the proportions substantially such as described, and when incorporated, subjected to a high degree of heat, as set forth, and this I claim whether other ingredients be or be not used in the preparation of the said manufacture as described.

MACHINE FOR SOWING FERTILIZERS—Warren S. Bartle, of Newark, N. Y., (assignor to Lyman Bickford and Henry Hoffman, of Macedon, N. Y.) Patented April 22, 1856: I claim the combination of two or more vertical shafts, provided with arms, with the outlet tubes of a machine for sowing fertilizers, &c., the whole being constructed, arranged, and operated in the manner and for purposes substantially as set forth.

COOKING STOVES—Austin Bronson, of East Port Chester, Conn. Patented August 23, 1854: I claim the employment of the heat equalizing chamber interposed between the fire chamber and the oven, substantially as described, when used in combination with, and made to communicate directly with the flues below the oven, substantially as described, and for the purpose specified.

SEWING MACHINES—T. J. W. Robertson, of New York City. Patented February 26, 1856: I claim imparting the necessary motion to the looper by means of the thread, substantially as set forth.

Canals versus Railroads.

MESSRS. EDITORS—In No. 32 of the present volume of the SCIENTIFIC AMERICAN, you say in your article entitled "Canals and Railroads," that "the wisest policy to pursue, apparently, is to utilize the canals, since we have them, as long as they pay their expenses, allowing them to die out gradually." You also assert in substance that railroads will supersede the Erie Canal, but surely you have not looked at the revolution its enlargement must produce in transporting the vast products of the West from the great lakes to the city of New York. No railroad can ever compete with it either in cheapness or expedition. The present year this canal is to have six feet of water its whole length, and next year seven feet. This will allow it to be navigated by steam propellers, which will reduce the expense of motive power full two-thirds and time one-half. One hundred thousand barrels of flour and half a million bushels of grain can be taken at Buffalo, and delivered alongside the storehouse or ship in New York in much less time, in better order, and at half the cost that it can be done by railroad. A boat carrying 240 tuns, say 2,400 barrels of flour, or its equivalent in grain, can be run from Buffalo to New York in five days, with four men, at a net cost of not exceeding $50, besides a fair allowance for use of boat and the tolls. It would require twenty-four freight cars to take this freight—the cargo of a single boat—and when on the cars, look at the multitude of cartmen and the handling it must undergo to get it on shipboard. The idea is preposterous that the immense produce of the West could be transported from the great lakes to the seaboard without the aid of the enlarged Erie Canal, and further, no railroad can ever compete with it in cheapness or expedition.

The propriety of taxing railroads or making them pay the same tolls as are charged on the canal is another matter—one, however, which I deem just under the circumstances—but which will be wholly unnecessary when the Erie Canal shall have been enlarged. I assert that the produce of the West must henceforth be transported on the Erie Canal to tide-water, and that railroads cannot compete with it, and must therefore abandon that branch of their business. It is wise, then, to complete the enlargement in the least possible time, and no section of the Union is more interested in this result than the city of New York—a city whose greatness depends on this canal and whose stupidity has always fought against it—from the days of "Clinton's ditch" to this present time. X. Y. Z.

Lockport, N. Y., May, 1858.

[We have no selfish ends in view in expressing opinions, *pro* or *con*, in relation to the Erie Canal. It has no doubt been of great benefit to the whole country, but when those who advocate its enlargement state that freight can be carried on it cheaper than on railroads, and at the same time advocate the imposition of taxes on railroads for the benefit of this canal, we must say that their statements and conclusions are contradictory, and their logic and sense of justice are very different from ours.

Our article referred to was principally aimed at the act of injustice which was intended to be perpetrated against our railroads, by the late Legislature, for the benefit of the canals, but our correspondent has taken up the matter in reference to the superiority of the Erie Canal over railroads for transporting freight. He anticipates an improvement in the use of steam on the canal in place of horses for towing. That, no doubt, will be an improvement, as coming nearer to the principle of railroad operations; but another greater improvement would be the adoption of the railroad on the banks of the canal, for the purpose of towing the boats by locomotives. There are some very general and mistaken notions afloat regarding the capacity and economy of railroads for carrying freight. It is our opinion that a double track railroad, of broad gage, built through the center of New York, and employed for no other purpose than carrying freight could be operated as economically, and could carry freight even cheaper than can now be done on the canal. The Reading Railroad, Pa., carries nearly as much freight per annum as the Erie Canal, and there can be no doubt but a railroad of the character we have named could do the same in New York.

Our correspondent states that when the Erie Canal is enlarged, a boat will be able to carry 240 tuns of wheat from Buffalo to New York in five days. A locomotive could do the same work on a railroad in two days, running at the slow rate of ten miles per hour. We have not the least objection to the enlargement, repairing, or anything else being done to the Erie Canal from its own resources, but, in strict justice, neither the public nor railroad companies should be taxed for any such objects.

Right and Wrong Musical Ears.

MESSRS. EDITORS—I am very well acquainted with a man whose ears are not mates—they are not in unison—both being tuned to a different key; still, in regard to hearing at a distance, they are both alike. But when a certain key is touched on the piano, (say the note A,) he is able to give the same sound with his voice, if he listens *only* with his *left* ear. If he closes the left ear, and listens only with his right ear, he cannot give the note, A, as before, but another, the note G—one degree of the musical staff below A. If the above statement of the case be correct, how can he listen to music with any degree of pleasure? It may be said that he cannot, one ear being tuned to the key of A, and the other to the key of G—A and G being consecutive notes—he would, of course, hear discords. The argument seems to be a plausible one. I am aware that a similar case has been recorded of a man who could listen to music only with feelings of horror. One ear was tuned to the key of A, the other to the key of G. But it is not true that the man in the other case is horrified with strains of music; nothing more agreeably arrests his attention than good music.

Can the SCIENTIFIC AMERICAN show why good music affected one man so unpleasantly, while it produces in the mind of the other feelings of pleasure? T. D. I.

Monroe, Mich., May, 1858.

[The most curious phenomena connected with this case is not that regarding which our correspondent interrogates us, but that whereby the person alluded to hears a tune played on the same key with both ears, at a distance, but different keys (A and G) when adjacent to the performer. Some mistake must have been made in the observations of the person alluded to, as he undoubtedly would hear nothing but discord if one ear were tuned to G, and the other to A. If the ears were tuned to the difference of a third or a fifth in the musical scale, harmony, of course, would be produced, but not to a second, such as between A and G.—EDS.

The Recent Steamboat Explosions.

MESSRS. EDITORS—In your issue of May 15th you have an article remarking upon the recent steamboat accidents upon the western rivers; and referring particularly to that occurring to the steamboat *Ocean Spray*, you close by asking: "What report will the inspectors for that district make of this horrible affair?" They *have* reported, and that too without any unnecessary delay. This report is, that the license of the engineer is revoked; this is all the punishment that could be inflicted by the inspectors under the law. The captain and mate—the other officers implicated—are not licensed officers, and therefore the inspectors have no authority over them. But revoking the engineer's license is not the end of the matter; for upon the basis of the inspectors' report, proceedings have been commenced against the captain, mate, and engineer, upon the charge of manslaughter.

By publishing this reply to your query, you will convey to your subscribers the desired information, and further establish your own disposition for FAIR PLAY.

[Good! Short, and to the point.—EDS.

Explosive Waters.

We have received a letter from our correspondents, Parsons & Hoig, of Jacksonville, Fla., in which they state they have been put to their "trumps" to account for explosions taking place in their steam boilers when there is an abundance of water in them, even "reaching to the upper try-cocks." They have a mill at the mouth of the St. John's river, and have sunk a tank in the sand to obtain fresh water for their steam boilers. In rainy weather they can obtain a sufficient supply of this, but during droughts they have to take salt water by a pipe from the river, and it is this water which is the cause of explosions. They have had three explosions in boilers; one five years, one eighteen months ago, and the other about the middle of April last. The boiler that burst latterly was thrown fifty feet into the air; everything in its vicinity was a complete smash—it was, in short, a young earthquake. Mr. Parsons says he has come to the conclusion that there must be some substance in the water which produces an explosive gas.

Our opinion is different from that of Mr. Parsons. Even allowing a gas to be generated in the boiler, it would not explode without being ignited, and this could not be done if the boiler had plenty of water in it. The boiler may have been *priming* when the upper cock was tried, and some water would flow out of it, although there was actually not a sufficient quantity to cover the flue lines. A deficiency of water, with an excess of steam pressure, may really have been the cause of these explosions. Such waters are also very liable to form incrustations, and if there were a thick scale formed in this boiler, it might have been displaced when working, and the overheated metal coming suddenly in contact with the water, a great supply of steam may have been rapidly generated, and thus have caused the explosion. But whatever may have been the cause of these boiler explosions, we cannot attribute them to anything in the water.

We believe that any steam boiler in the same situation if blown off frequently, cleaned out every two weeks, and strict attention paid to have plenty of water in it while working, will not explode, provided the pressure is not carried too high.

Harmless and Sure Cure for Warts.

Take two or three cents worth of sal ammoniac, dissolve it in a gill of soft water, and wet the warts frequently with this solution, when they will disappear in the course of a week or two. I have frequently tried this cure for warts, and it has never failed.

A. P.

[We are inclined to believe in the efficacy of our correspondent's cure for common warts, because we know that alkaline solutions softens them, and gradually eats them away, as it were. We have removed some of these unpleasant skin excrescences with a weak solution of potash applied in the same manner as the sal ammoniac.—EDS.

Lakes

Are insoluble compounds, formed by precipitating coloring matter with an earth or oxyd. The chief lakes are *carmine*, obtained from cochineal by precipitation with Roman alum; *Florence* lake, prepared by the same process from the sediment of cochineal, by precipitation with solution of tin; and *madder* lake, prepared from Dutch crop madder by precipitation with alum.

New Inventions.

Electric Lamp.

In the production of light by electricity it has heretofore been found exceedingly difficult to render the light constant and uniform, owing partly to the difficulty of keeping up an equal distance between the electrodes, and partly to the difficulty of keeping them pointed. The object of this improved lamp—the invention of Henry M. Collier, of Binghamton, N. Y., and Henry N. Baker, of this city,—is to overcome these obstacles. In the first place, the points are not separated at all, but are kept in contact. To produce a light in this way has generally been supposed to be impracticable; but the inventors, by long continued experiment, have found that by employing an electric current of very low intensity but large quantity, they are enabled to use the points in contact. The invention consists, first, in certain means of controlling the positions of the electrodes, by which they are kept properly in contact with each other as they wear away by the disengagement of the particles, without the difficulty experienced in keeping up a proper degree of separation between them. The difficulty of keeping the carbon electrodes pointed, has resulted from particles of carbon being carried over by the current of electricity from the positive to the negative pole of the electrodes, the current of electricity having always been in the same direction. With a view to obviate this, the invention also consists, secondly, in frequently reversing the direction of the current of electricity through the electrodes. To obtain this change of direction, the current of electricity evolved from a magneto-electric machine is used, without the intervention of a frotteur or brake plate, or else the current from a galvanic battery can be used, there being arranged in the circuit a brake plate or pole-charger, which is rotated by electricity, by clock-work, or by any suitable mechanical means to produce a frequent change in the direction of the current. This invention is a valuable contribution to applied science, and will do something more towards rendering this most brilliant light practically available. By reference to our list of patents granted this week, the claim will be found.

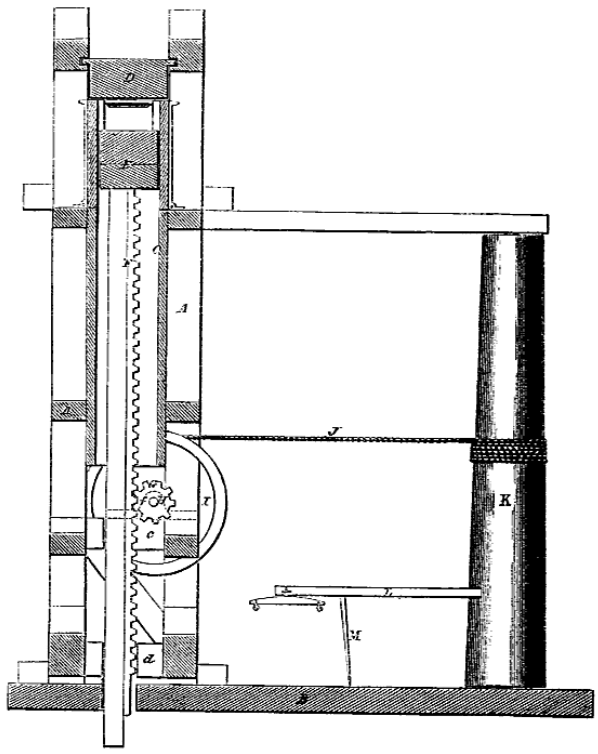
Improved Cotton Press.

This is an improvement in that class of cotton presses known as the "jack-screw press," which is one of the simplest forms of the cotton press, and the improvement is intended to simplify its construction so that it can be worked by the most unintelligent of workmen; to render the follower self-lowering, and also to lessen the weight of the toothed rack bar which carries the follower, without impairing the strength at the point where the greatest strain comes upon it. How these points are attained we will proceed to describe.

In the first place, the follower presses upward instead of downward; and when it is elevated to its full extent and has pressed the bale, it can descend by its own gravity. In the second place, the toothed rack bar is made gradually tapering, so that it takes less metal, and requires less power to operate it than as ordinarily constructed, and the taper is graduated to the strain. This can scarcely be seen on so small a scale as our engraving, which is a sectional elevation of one of these presses, but in the actual press it saves a great quantity of metal.

A A represents the framing of the press, B is the floor on which it rests, C the pressing box, and D the platen against which the cotton is pressed. E is the follower, furnished with guides that play in grooves in the box, C, and they serve to control the extent of the downward movement of the follower. F is a toothed rack bar, on which is a follower. This bar is of taper form on each edge, from top to bottom, being about eight inches broad at its base, and six at the top. It is guided in its up-and-down motion by guides, *c d*, and can descend its full extent through an opening in the floor. G is a pinion wheel for gearing into the teeth of the bar, as shown. This wheel is arranged on a shaft, H, situated below the pressing box, and furnished with suitable bearing boxes, *f*, in the frame, A. I is a large grooved pulley, arranged on the same shaft with the pinion. J is a rope attached to, and wound around, the periphery of the pulley, and carried to, and attached to, a windlass, K, that is pivoted in the floor, and to a framing, as seen in the illustration. The windlass, K, has a horizontal sweep, L, attached to it, provided with a stop pawl, M,

BOCAGE'S COTTON PRESS.

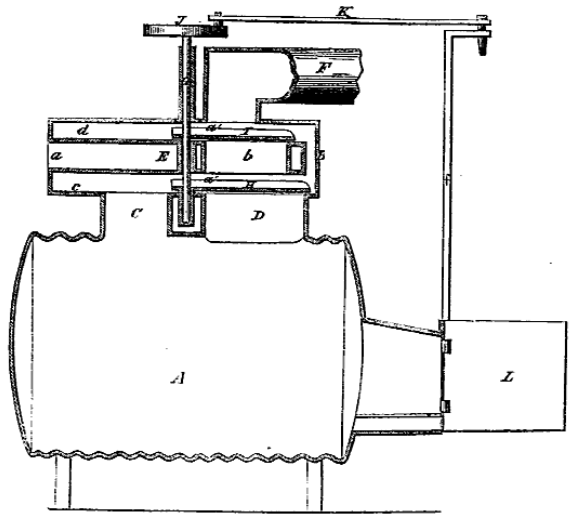


that can be thrown up or down alongside the sweep, when it is desired that the follower shall descend. The horses, or other power, are attached to a whiffletree on L.

By having the follower press upward, greater convenience is secured, as the pressing-box can be situated in the picking or ginning room, and thus time and labor used in transporting the cotton to the press are avoided.

This useful machine is the invention of J. W. Bocage, of Pine Bluff, Ark., and was patented by him February 2, 1858. Any further information can be obtained by addressing the inventor.

DWIGHT INGERSOLL'S AIR-HEATING FURNACE.



One of the chief inconveniences attending the use of air-heating furnaces arises from the fact that in the combustion of the fuel, particles of solid carbon get taken up by the draft, and these, lodging in the draft passages and radiator, gradually accumulate, and fill up the passages, thus preventing the perfect operation of the furnace. The invention we are about to describe is designed to obviate this difficulty by arranging the radiators and dampers of the furnace in such a way that the dampers may be made to perform the double function of dampers and scrapers, and thereby keep the radiators perfectly clean, with great facility. Our engraving is a vertical central section of a furnace, showing this improvement.

A is the body of the furnace, and B is a cylindrical radiator or drum that is placed above it, and communicates with it by flues, C D. The flue, C, is cylindrical, but the flue, D, has two parallel sides, with semi-circular ends—a transverse section forming an oblong. E is an air-heating chamber, which is of circular form, and is fitted horizontally within the radiator, B. This air chamber is quite shallow, and communicates with the external air by means of passages, *a*, the orifices of which project through the side of the radiator, B. A passage, *b*, is made through the chamber, E, in line and corresponding in form with the flue, D, and F is a smoke pipe, communicating with the upper part of the radiator, B. G is an arbor, which passes vertically through B and E, and it can turn freely within them. On this arbor, G, two dampers, H I, are placed directly over one another, and in the same plane; they are formed of flat metal plates, rather larger than the flue, D, both being constructed exactly alike, and having a flanch, *a'*, on each of them.

The damper, H, is placed directly over the bottom plate, *c*, of B, and the damper, I, is placed immediately over the top plate, *d*, of the air heater, E. To the upper end of the arbor, G, a wheel, J, is attached, and one end of a rod, K, is pivoted to one side of it, the other end of the rod being pivoted to a crank on a rod, *f*, which also forms the joint rod of the door, L.

The operation is as follows:—The products of combustion pass up through the flue, C, through the radiator, B, and through the passage, *b*, that is made through the air-heater, E, and up between the inner edge of E, and the sides of B, (E being of somewhat less diameter than B,) and into the smoke pipe, F. The damper, H, works directly over the orifice of D, and the damper, I, works over the orifice, *b*, and it will be seen that as the door, L, is opened or closed the dampers, H I, will move over the orifices of the flue and passage, keeping them free from soot or dirt, the dampers closing D and *b* when the door is closed, and moved off them, or leaving them open, when the door is open, to prevent smoke or gas escaping into the air.

By detaching the rod, K, from the rod, *f*, the dampers, H I, may be turned completely around, so that all the soot and dirt may be loosened, and passed down the flues, C D, into the fire.

This invention saves much labor, for it is extremely difficult to clean many forms of radiators, it being impossible to render their interiors very accessible; but by having the dampers arranged so as to operate as above described, the radiator can be kept perfectly clean.

The inventor is T. Dwight Ingersoll, of Monroe, Mich., and a patent was granted to him March 30, 1858. By addressing him as above any further particulars can be obtained.

Improved Zincographic Press.

G. H. Korff, of Hoboken, N. J., has invented a new press for the purpose of zincographic printing. It is a cylinder press, the face of the cylinder being of zinc, and on this the design is drawn; around the cylinder there are arranged damping and inking rollers, which perform the operations hitherto done by hand. These are combined with feed and pressure rollers, so that a rotary power press is obtained of great simplicity and value. It was patented this week, and the claim will be found on another page.

A Telegraph to Cuba.

A mercantile firm in Havana has obtained a special permission to lay a submarine telegraph between the Island of Cuba and Key West, Fla., and it is believed that the work of surveying and sounding the route and fabricating the cable will be speedily proceeded with.

Scientific American.

NEW YORK, MAY 29, 1858.

Reform of our Patent Laws.

The period is now rapidly approaching when Congress—which has been in session since December last—will adjourn, and its members will disperse to the respective localities of their constituents. This will probably occur on the 7th of June, and many months will elapse before they meet again. In reviewing the business which has been transacted during the sittings of this Congress, we note, with regret, that although some measures of public and private utility have been passed, there has been transacted a large amount of business of little practical importance to the community, in comparison with many measures which, though of vital interest to the American people in every walk of life, have yet been very cursorily, if not contemptuously, treated, and some have been even altogether overlooked. If these measures are not acted upon during the short time intervening between this and the day of adjournment, the neglect will reflect discredit and even shame upon the character of Members of Congress as men of zeal for measures of great public interest.

One of the chief of these neglected measures is that bill for amending our patent laws which was reported by the late Senator Evans and by Judge Stewart, Chairman of the House Committee on Patents, a condensed abstract of which was given on page 222, this volume, SCIENTIFIC AMERICAN, and which bill is universally conceded to be the most sensible, honest, and praiseworthy movement, made with a view to legal reformation, that has ever been attempted since the enactments of 1836-7. It is not our purpose to go into any discussion of the character and importance of this proposed amendment. Our opinions were fully given in a previous number (29) of this journal. Our object, now, is simply to urge the claims of this bill upon the attention of Congress, and to call upon the Members to act upon it without delay.

The proposed bill does not embrace radical and sweeping reforms—this is not necessary, and in our judgment such a course would work serious consequences to those interests that claim its guardianship; but it simply knocks off the rough corners of the present system, and meets the pressing necessities of the Patent Office, and will enable that department of Government to transact its business with increased economy and efficiency.

This is not a mere question of local importance, like the dredging of some foul river, or the running of some out-of-the-way boundary, or the opening of a post-road into a region where civilization has scarcely obtained a foothold; but it is a question of deep interest to *all* our people. Farmers, mechanics, manufacturers, citizens—men, women and children—all are concerned in this matter. The roots of inventive genius lie beneath all the stepping-stones of social progress, from pegs and pins to steamships and Atlantic cables. We seriously fear that Members of Congress are not aware of the very general interest which their constituents feel in regard to the advancement of inventive skill and ingenuity. We know that this interest is wide-spread and general; and it is astonishing, in view of the magnitude and importance of the subject, that so few Members of Congress ever lift up their voices in behalf of measures intended to foster and sustain inventive genius. It may be very convenient for the candidate from the stump to speak, and very pleasant for the susceptible ear of the constituent to hear, eloquent words about steamships, railroads, electric telegraphs, &c.; but the almost total indifference of members to the interests of the inventors of the above and kindred works is best shown by the practical forgetfulness and the almost criminal neglect which is exhibited towards the Patent Office—the noblest and now one of the best conducted bureaux under Government.

An honest reformation in the patent laws should become a primary question for the earnest consideration of Congress. It is not sectional, and has no political party bearing; and in this sense it is a question that stands far above many others upon which much earnest and diligent attention has been bestowed. It has been said—and with how much truth we must leave others to decide—that, "if it were a mere party squabble, embracing nothing to benefit the people, or if it were a measure from which parties or cliques could derive personal benefit, it would more readily meet with prompt and decisive attention." We hope that the members of the present Congress, will so act as to put an effectual extinguisher upon such an imputation; but to do so they must be prompt and decisive in action.

It often happens that, just prior to the adjournment of Congress, the business becomes so confused and crowded that some good and necessary measures get the go-bye; while others concocted for private interest, and designed to be pressed upon the attention of members in such moments, are rushed through with indecent haste. We trust that the patent bill to which we allude will not meet with the fate of any of those good, neglected measures; although the time for acting upon it is now very limited. It is not a hastily concocted measure, nor is it one in respect to which members can honorably plead ignorance. It has been before them a sufficent length of time for the closest scrutiny, and can be now acted upon intelligently and speedily; and it appears to us that it only needs to be taken up for definite action, to meet with a speedy and favorable termination. If the present Congress should adopt this bill, the act will redound to its honor; as it will show that, amid bitter personal and party struggles and strife, its members did not neglect the pressing claims of our ingenious and talented inventors and mechanicians.

Railway Bridges and Timbers.

A most lamentable accident occurred on the New York Central Railroad on the 11th inst., near Utica, by which nine persons lost their lives, and a much greater number were severely wounded. Two trains—one going East and the other West—happened to come upon a small bridge over the Sauquoit Creek at the same time, when, just as the locomotives reached opposite sides, the structure fell with a crash, and the cars were dashed to fragments. This accident seems to have been caused by the most culpable ignorance or carelessness on the part of those whose duty it was to attend to the bridge department of that railroad.

On the 15th inst., the Coroner's jury rendered the following unanimous verdict in this case:—

"We find that the persons whose bodies have been viewed by us came to their death by the giving way of the bridge of the New York Central Railroad, crossing the Sauquoit Creek, in the town of Whitestown, Oneida county, on the morning of the 11th of May, and that they were all passengers by the Cincinnati express train coming East. The deaths were caused by the insecurity of the bridge, owing to the same being decayed and rotten. A portion of the bridge was constructed of inferior timber, the same being bastard elm. We find the deaths were caused by culpable neglect on the part of the Central Railroad Company, in not causing this bridge to be properly examined."

From the evidence given before the jury, it would appear that the bridge was built about three years ago, and composed principally of bastard elm, which generally rots in about two or three years at furthest when exposed to the weather. How cent-wise and dollar-foolish some of our railroads are managed? If that bridge had been built of good oak timber, it would have been sound yet, and the Company would not have been called upon to pay the enormous sums which will be justly demanded for the lives taken and the injuries received by this accident.

It appears to us that most of our railroads are managed with the most open stupidity as it regards the kind and quality of timber used for bridges, ties, &c. These cost vast sums annually for repairs and replacement, on account of their liability to rot, whereas they could be rendered three times more durable, and thus save a vast expenditure for fresh timbers, and the labor required in building and relaying them. We have frequently directed the attention of our railroad companies to the economic results which would accrue to them were they to use "prepared timbers," but they seem to be deaf to disinterested and unselfish admonition. Had the bridge over the Sauquoit Creek been constructed of "prepared timber," although it had been bastard elm, the fatal accident alluded to would not have taken place, and the bridge would have been good for ten years to come yet, and all by a very little extra expense.

In Europe preserved timbers are employed on all the railroads. The expense for railroad repairs in Great Britain is about 10 per cent annually, while with us it is on an average 25 per cent—our railroads require to be entirely relaid every four years. Timber impregnated, under pressure, with a weak solution of sulphate of copper, chloride of zinc, or bi-chloride of mercury, will have its life extended from four to twelve years. Creosote, or oil of coal tar, is also a very good timber preserving agent, and is now employed in Holland for this purpose with decided success.

Some years since, a number of our railroad companies made trials with timbers prepared with the chloride of zinc, and the results were decidedly favorable and profitable regarding their use. But new short-lived boards of managers are not the best bodies to direct a profitable policy, hence, because each sleeper cost ten cents extra for preparation, their use was discontinued, although the process increased their durability from four to twelve years. We hope all our railroad managers will "amend their ways," by adopting the suggestions presented. We have repeatedly directed their attention to this subject, and will do so again upon every proper occasion until a decided reform is effected.

Doctor Robert Hare.

This distinguished American *savant* departed this life in Philadelphia on the 15th inst., at the advanced age of 77 years. His name has been before the scientific world since the beginning of the present century on account of his chemical acquirements and discoveries in that science, and several mechanical inventions of great importance. His invention of the oxy-hydrogen blow-pipe has rendered his name familiar as a "household word" in every chemical laboratory, as by it platina and other fractious metals previously infusible by other means were fused by him with ease. For this invention he was awarded the Rumford medal by the American Academy of Arts and Sciences at Cambridge, Mass. He was for thirty years Professor of Chemistry in the University of Pennsylvania, and though by no means a brilliant, he was a very sincere and instructive lecturer. Rather controversial in his nature, he was more ready to use strong than elegant language in defending his opinions. In his younger days he was a very close and devoted student, and on this account, we think, his mental powers were more impaired than those of his body for some years prior to his decease. This, we believe, was the cause of his exceeding credulity in the delusions of spiritualism, a belief which he embraced upon grounds which, from their very trivialities, filled us with sorrow as we listened to his lecture on the subject in the old Tabernacle of this city, three years ago. In appearance he resembled a stern old Roman of the Regulus stamp, as represented by painters.

Artesian Wells in California.

A correspondent—H. S. Sargent, of Stockton, Cal.—informs us that there is an artesian well in that city one thousand and three feet deep, and capable of throwing water ten feet above the established grade, and discharging two hundred and fifty gallons per minute.

Warning to Mechanics and Others.

The Leavenworth (Kansas) correspondent of the St. Louis *Republican* complains that a large number of mechanics and laborers, particularly stone masons, are enticed to the West by extravagant advertisements in eastern papers, promising them work at high prices, when no such demand for their labor exists. Such reckless conduct on the part of heartless speculators, whose object is to exact bounties from credulous applicants for employment, cannot be too strongly censured. Mechanics and others do wrong in emigrating to any distant western State without having more positive assurances of employment after reaching there than the doubtful promise contained in the advertisements of those who live by duping the unwary. In a late article, we took occasion to commend the efforts of societies established in many of the eastern cities for the purpose of obtaining employment for the worthy poor who are anxious to go West, and to facilitate their emigration thence; and we would advise all such persons who contemplate making a journey hundreds of miles in search of employment, to consult the disinterested members of these societies in relation to the most suitable place for their labor, and other essential points, before taking the final step.

The Infected Ship.

A correspondent suggests a very simple method of disinfecting this ship, by means of chlorine, and one which, at the same time, would be very cheap. His plan is this:—Lower into the ship a few portable furnaces filled with glowing coals, and having on them an iron disk, in which is one of glass containing a quantity of common salt, into which a gutta percha tube dips, the other end of which reaches to the deck. All being prepared, the hatches are closed. Oil of vitriol is poured down the tube into the salt, and the tube withdrawn; and when (in a month or six weeks) the ship is opened, our correspondent thinks that the chlorine evolved from the salt by the vitriol will have penetrated every portion of the ship, and thoroughly disinfected it. Another correspondent suggests the injection of hot steam; while a third thinks that if the ship were filled with sliced onions it would be completely disinfected. We do not think that the last plan is likely to be adopted.

Mechanical Force of Lightning.

It has been proved on one occasion that a flash of lightning must have struck a church—St. George's, Leicester, England,—with a force equal to more than 12,000 horse power. A single horse power is equal to raising 32,000 pounds one foot high in one minute. The force of the lightning, therefore, was equal to 384,000,000 pounds raised one foot high in one minute. This is equal to the power of twelve of our largest steamers, having 24 engines of 500 horse power each.

Morse Telegraph in France.

A commission appointed in France to consider the claims of Professor Morse, for remuneration, because his telegraph was employed in that country, have reported in his favor, and have recommended the payment to him of 400,000 francs. As Professor Morse's telegraph was first patented in France, and has been the one mostly used in that country, where all the telegraphs are under government control, the sum is very respectable.

Mechanical Bakery at Baltimore.

The citizens of Baltimore have obtained a boon, in the shape of one of Berdan's mechanical bakeries, which opened there a few days ago. At the opening, some six hundred persons were present, and the president, William Norris, Esq., set forth in a neat speech the advantages to be derived from this invention. Mr. Berdan replied, and made some practical remarks, which were responded to, on behalf of the citizens, by Judge Lee.

Acknowledgment.

We have to thank G. J. Tucker, Esq., Secretary of State, for the census of the State of New York for 1855.

The Cause of Sound and Music.

Our attention has been directed to an article in *Frank Leslie's Illustrated Newspaper* on a "new theory of acoustics," principally relating to music, by S. B. Driggs. A person may be well acquainted with acoustics, and may understand the principles upon which the science of music is based, and yet may be no musician. On the other hand, a person may be a musician, and yet be unacquainted with the laws of acoustics. A musician is a person who can readily strike the different notes of music and produce harmonious sounds, either with the voice or an instrument. The art of music is solely a practical one. The number of musicians, as well as non-musicians, who are acquainted with the cause of sound and music, is but small, therefore a brief dissertation on the subject will not be devoid of interest or instruction.

Mr. Driggs says, in regard to his new theory of acoustics, "I discard the belief that sound is produced by air alone, commonly called concussion, producing waves or circles of air, and shall treat sound itself as possessing a more independent existence, and attempt to show that atmospheric air acts more in the capacity of a medium to convey it to the ear, and is the telegraph wire that conveys the impression it receives, and that is not *the first cause*."

It was at one time believed that sounds were produced by emissions from bodies, like odors from flowers, and that these affected the sense of hearing as perfumes the sense of smelling; Mr. Driggs appears to be tinged with a kindred opinion. He is evidently mistaken in supposing that any scientific man acquainted with the laws of acoustics entertains the opinion that atmospheric air is either the first or only cause of sound, or that it is even the *sole* medium for conveying it. Sound is caused by the simple but rapid mechanical vibrations of various elastic bodies. These when moved or struck so as to vibrate, communicate the same kind of vibrations to the auditory nerve of the ear, and are then appreciated by the mind. Sound is conducted through the air, but there are other conductors superior to air, such as iron which conducts it seventeen times faster; some kinds of wood eleven times, and water four and a half times faster. This power of conduction depends on the peculiar structure of the body not its density; the atmosphere, however, is the great and general medium of sound, although any other body which can communicate the same vibrations to the auditory nerve will answer the same purpose. By closing the ears and inserting a long strip of dry wood between the teeth, the ticking of a watch or any other sound produced at the extreme end of it will be heard more distinctly than coming through the air, and having both ears open; this is a very old and well-known fact. The instrument called the *syren* for counting the number of sound waves produced in a second of time, will yield the same tones in water as in air, thus proving that air is not the sole cause or medium of sounds.

A strong wind moving at the rate of twenty feet per second causes no sound; a body, such as the hand, swept rapidly through the air, although it produces waves, does not cause sound. Why is this? If sound is caused by vibrations, why do the waves of the atmosphere produced in these instances not cause sound? It has been demonstrated by accurate experiments that the air must move with a wave velocity of 1,125 feet per second to produce sound; a lesser wave velocity is not appreciated as sound by the human ear. The wings of a bee or a musquito must therefore vibrate to produce air waves of 1,125 feet velocity, or we could not hear their humming noise. The chirp of a cricket and the booming of a cannon move with a velocity of 1,125 feet per second. Simple sounds consist of a succession of rapid waves moving *irregularly*; musical sounds consist of a series of simple sounds falling upon the ear at *regular* intervals. These sounds or vibrations reach the ear and agitate the air within it, communicating an equal amount of vibration to the tympan or membrane stretched across a cell in the head, in which are arranged a series of curious little bones, namely, the *malleus* (hammer), *incus* (anvil), *os orbiculare* (rounded bone and the smallest in the human body), and the *stapes* (stirrup). The latter is connected with a membrane, which closes three semi-circular canals filled with water; these are lined with an expansion of the auditory nerve, which take up the vibrations to the mind.

The sense of sounds—both simple and harmonious—depends on the proper condition of the very delicate and complicated organs of hearing. It is easy to conceive how a very small derangement of the ear bones, the membranes, or the fluid in the ear cells, will injure the sense of hearing in regard to both the volume and the character of sounds.

If we take the string of an instrument and strike it so as to produce sixteen waves moving at the rate of 1,125 feet per second, we obtain what is considered the lowest musical sound, which is the note, C. If we vibrate the string, so as to produce thirty-two vibrations in the same time, we obtain the same sound exactly, but a different pitch; it is also the note, C, but an octave higher. And if we proceed to double the number of these vibrations until we attain to a fourteenth (2¹⁴) power, namely, 8,192 vibrations in a second, we reach the highest note in common music, which is five octaves above the middle, C, of the piano. The extreme limits of the human voice in males varies from 384 to 1,266 vibrations per second; in females from 1,152 to 3,240. Like the seven colors of the rainbow, there are but seven notes of music, which are A, B, C, D, E, F, G; each represents (according to its position on the staff) a certain number of vibrations in a second. All music, from the loftiest oratorio to the most simple lay of the shepherd on his reed pipe, is produced by regular combinations of these vibrations. When they are not regular, we have discord, not music. Upon this theory the whole science of music is based.

Every key in a piano is arranged so as to produce a certain number of rapid vibrations in a given time. If we take, for example, a string which will make one hundred oscilations in a second, and shorten it to half its former length, its vibrations will be doubled—it will oscilate 200 times in a second, and yield a note exactly an octave higher than the former one. It is by this arrangement of strings that the different notes are struck on the pianofore. As these strings generate a definite number of vibrations in a given time, unless the keys are struck so as to make these occur at regular intervals of time, mere noise and not music is the result. The keys of the pianoforte are arranged in multiples of 2 to produce harmony. When two keys close together are struck, there is discord, because their vibrations do not occur at regular intervals. If the interval is a third, it is harmonious, because it is regular, and is obtained by striking two keys, leaving one untouched between the two beating fingers. Of course, there is much in the combinations of sounds apart from these statements, which cannot now be enlarged upon, but we think we have conveyed a very clear idea of the causes of sound and music.

A very remarkable proof of the vibratory nature of sound is heard when two notes very nearly, but not quite unisonant are sounded together. A periodical interruption of the sound called a *beat* occurs at intervals which are longer, the nearer the two notes approach to perfect identity, and may often be as long as half a second. To understand this, we must remember that each pulsation of air consists of two contrary motions to and fro. Now, if one sound produces the forward motion when the other tends to produce the backward motion, the two, if equal, will annihilate one another, and produce silence. This is exactly in accordance with the laws of mechanics, and proves that sounds are produced by the motion of ponderable bodies.

Another musical phenomenon called *sympathy* goes to establish the same fact. The waves of sound set in motion by a flute, cause the wires of a pianoforte, each according to its note, to vibrate with the same notes of the flute. A glass vase pitched to a certain note may be set ringing by the human voice striking the same note; and it is stated that Madame Catalani, the celebrated Italian vocalist, whose voice was of great power and compass, had on several occasions broken crystal goblets with her voice. This is explained by the well-known laws of mechanics upon the same principle by which several suspension bridges have been broken down by the regular pulsations of wind storms, and the steady regular tramp of soldiers passing over them. The regular waves of the atmosphere communicated to the glass goblet set its particles vibrating, and these pulsations accumulated until the disruptive force exceeded that of the cohesion which held the particles of glass together, when as a legitimate mechanical consequence, the goblet was rent in pieces.

There are various qualities of the human voice, as well as instruments. Seldom do we hear two voices in a choir of the same quality of tone—although all may be singing at the same pitch—they are as various in quality as the human face is in form. The cause of this is mostly owing to the *form* of the waves, which each singer imparts to the atmosphere by the construction of the throat and mouth. Some waves are of the form of elipses, such as those produced by strings; others as circles, such as those of the flute and organ; but the forms of sound waves are of endless variety, hence the different qualities of the sounds we hear from voice, harp, pianoforte, flute and organ.

We cannot tell why it is that regular mechanical vibrations of the atmosphere are the source of so much pleasure to man; we only know that such is the fact. He is constituted to enjoy music; it imparts exquisite delight, and is the chief of all ennobling and innocent amusements.

Can there be a Great Scarcity of Timber in the United States?

ARTICLE 3.

Messrs. Editors—Impressed with the great importance of this subject, as the reader of your valuable paper may already be, it will be still more interesting to peruse the views of the author we have quoted in regard to the cultivation of timber in our country. He states a fact which is highly surprising, and that is, that timber in this country of primitive forests costs at present in all the places where it is consumed two and a half times as much as in Bavaria. This may be the cause why wood gas has not made so much headway in the United States as on the European continent. Such a great difference in the prices of timber is easily explained, if we take into consideration that the inhabitants of the United States have increased since the year 1776 to the present time to at least tenfold the original number; that consequently cities, towns and villages have sprung up in this period to an extent unparalleled in history, and that the same rapid growth has characterized the railroads and mercantile marine—all devouring an immense quantity of timber. To these is to be added the annual consumption of wood as fuel in the cold winters in the North, and all over the country, which is not always done in a very economical way. We say nothing of how the clearing of wood is viewed by the farmer, but it is known he considers its destruction a great gain, as it gives him more arable land for plowing.

We thus understand why there is already a scarcity of timber in some parts of the Union. How is it to be remedied? Our author suggests a somewhat similar plan in regard to timber as a Member of Congress (Mr. Morrel) lately suggested in regard to agriculture. But the growth of timber being very slow, he thinks that laws should be enacted in each State to encourage the cultivation of trees particularly on ground which is not adapted for agricultural purposes. He thinks that in States where there are swamps the people or their representatives should undertake the draining of them, and plant trees thereon, and these to be the property of States, as canals were built, and are managed in our day. The federal government, too, he believes, ought to take such measures to have the forests or government lands systematically maintained, and they should employ for this purpose able officers, and make from the sale of wood a regular annual revenue.

We leave, however, these suggestions to be discussed in other quarters, having fairly presented them as the simple views of a professional forester.

L. R. Breisach.

Photography Applied to the Ornamenting of Silk Stuffs.

M, Persoz, professor of chemistry at the Conservatoire des Arts et Métiers, of Paris, says the London *Engineer*, has just published a most interesting discovery of his, by which photography may be applied to the ornamenting of silk stuffs. The bichromate of potash is a substance commonly used in photography, being extremely sensitive to light. If a piece of silk stuff impregnated with this salt be exposed to the rays of light penetrating through the fissures of the window blinds in a closed room, the points where the stuff has received these rays of light will assume a peculiar reddish tint. Now, suppose a piece of metal, or of strong paper, to be cut out after a given pattern, and to be laid on a piece of silk prepared as before, if exposed to the sun, or, better still, to simple daylight, the pattern will be reproduced in a few seconds. The pale red which the exposed parts acted upon assume, is so permanent that nothing can destroy it; nay, it will fix other colors, such as madder, campeachy, &c., just like a mordant, and in that case it will modify the color of those substances in absorbing it. The process may be varied as follows:—Let a fern leaf be placed upon a piece of prepared silk, and kept flat upon it by a pane of glass; then that part of the silk which is protected by the leaf will retain its original color, while all the rest will receive the impression of light, as above described, forming the ground upon which the figure of the leaf will appear in white, grey, or other color the silk may have had before the operation. The richest patterns may be thus obtained on plain silks, and at a comparatively small expense.

Apoplexy.

Persons below the middle hight, robust, with large hands and short thick necks, are generally recognized as apoplectic subjects; but a foreign medical author asserts that it is confined to no particular conformation of the body, *all persons* being alike liable to be attacked by it. The predisposing causes are the habitual indulgence of the appetite in rich and gross food, or stimulating drinks, coupled with luxurious and indolent habits; sedentary employments carried to an undue length; the habit of sleeping, especially in a recumbent posture, after a full meal; and lying too long in bed. Persons, however, who are predisposed to this disease should not fail to profit by the warnings of its approach, such as giddiness, drowsiness, loss of memory, twitching of the muscles, faltering of the speech, &c. Their diet should be light and nutritious; all luxurious habits should be abandoned, and moderate exercise should be taken. Above all, they should avoid giving way to their passions, as it is well known that many persons have been struck with death in the midst of a fit of anger.

Iron Bridges.

The Portland *Argus* reports that twelve iron bridges have been put on the Grand Trunk Railway line within two years, being substitutes for the wooden bridges originally built. It says the terrible accident on the New York Central Railroad by the breaking of a decayed wooden bridge, suggests this notice of the praiseworthy efforts which the company is making to prevent the possibility of such accidents on the line from Portland to Montreal.

Correspondents

F. D., of N. Y.—We are much obliged for your letter. The party to whom we referred is not the one named by you.

W. P., of C. W.—We do not know where you can procure, in this country, machinery for fence-making.

J. H. C., of Ohio.—The party to whom you refer cannot, by the re-issue of his patent, and the alteration of his claim, deprive you of your right to whatever was originally assigned to you. The object of a re-issue is to correct some error discovered since the issue of the patent, and therefore your rights are not impaired by such reissue.

R. L. S., of N. Y., enquires if we know of any methods of connecting the wires of the telegraph with the earth by means of a connecting wire for the purpose of preventing damage being done to the poles by lightning. Answer:—We do not know of any conducting substance which can make that nice distinction necessary to carry off lightning without taking the current of electricity from the battery with it. If Mr. S. has got a metal that can discriminate on so nice a point, he has got a little beyond our scientific acumen.

W. W., Jr., of Mass.—The blue color you observed on the bottle containing sulphate of quinine is due to that substance, for it possesses the power of polarizing light.

J. J. Heron, of Sunbury, Ohio, wishes to correspond with the manufacturers of the best horizontal shaft water wheels for saw mills.

G. F. D., of Ga.—Messrs. T. & J. Aldrich, of Jersey City, N. J., will answer your inquiry concerning their patent steam generator, if you address them. Treadgold's work on the steam engine will answer your purpose. D. Appleton & Co., book publishers, this city, can furnish it.

C. P. H., of Pa.—Address Anthony Pierz, of this city, for informa ion relative to making a fertilizer out of leather scraps.

J. A. S., of Minn.—The substitution of a cam for a crank for giving motion to a mill saw is an old idea, and consequently not patentable.

L. H., of Conn.—G. H. Wood, of Green Bay, Wis. has a good rock-drilling machine, which he has secured by Letters Patent in this country and abroad.

J. C., of N. J.—The excess of soap, alkali or grease used in cleansing cloth has often been used over again; but it is no actual saving. At an early opportunity we will write on the subject you mention.

O. V. F., of Ohio.—We do not believe it possible to impregnate dough or paste with atmospheric air sufficiently to cause the same to rise and expand when exposed to heat, and occupy four or five times the space of its original bulk, as required to produce healthy bread. It is a well-known fact that water will absorb its own bulk of carbonic acid gas, however dense it may be rendered by pressure, and by mixing the dough with water thus impregnated while under pressure, according to Daughish's process, it is diffused throughout all its parts, and when relieved of its pressure the gas leaves it, and in so doing expands the dough into a beautiful spongy and elastic mass. Constructing bottoms of chairs of tin, zinc, or sheet iron, in the manner you propose, is not new.

R. S., of Me.—We shall be happy to receive practical and useful information from you, regarding the manufacture and application of iron girders.

J. L., of Va.—The material you sent us is a micaceous sand, and does not appear to contain any silver. If you have good reasons for thinking it does, from the geology of your district, send to an analytical chemist and get a specimen examined.

E. H., of Mass.—The patent to which you refer is now in the hands of a company here, with prospects of good success. It was sold in England for a very large sum—report says $100,000.

W. M. F., of N. J.—We do not know where you can obtain the metal aluminum for dental purposes.

H. E. G., of Ill.—We do not know where you can obtain left hand auger bits for boring in a reverse direction to the ordinary bit. The best metal to be used for journal boxes liable to heat, is that known as the Babbitt metal, the receipt for which recently appeared in our columns.

H. R., of Iowa.—Rice is made to imitate pearl by boiling it to the consistency of paste, and subjecting it to a strong pressure between surfaces indented with angular or prismatic ridges, for extracting the aqueous matter from, and solidifying, the substance, and giving it such prismatic ridges on its surface as will decompose the light, and give the peculiar pearl-like hue to it. If there is anything new in the construction of any part of the affair you contemplate forming of iron, it can be patented.

R. L., of N. Y.—If you assigned one-half of your interest in your patent to a party, and a part of the consideration was to the effect that the purchaser should devote his time to the introduction of the invention, and he fails to do so, your only remedy is to sue him for violating his contract. You cannot get the assignment reroked.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, May 22, 1858:—

H. D. W., of Mich., $25; J. H. N., of Iowa, $55; E. B. W., of N. C., $25; S. P., of Mass., $35; D. J. F., of Wis., $30; W. N. W., of Ohio, $30; B. B. S., of Mass., $30; J. C. F., of Texas, $55; M. G. B., of Tenn., $30; D. S. M., of N. Y., $55; D. Y. C., of Pa., $25; W. H., of Ohio, $35; E. J., of Conn., $27; H. L. A., of Wis. $30; A. D., of N. C., $50; A. J. C., of Tenn., $30; A. F., of N. J., $30; J. O., of Pa., $5; G. W. R. S., of Va., $25; P. T. L., of Ala., $41; M. C. C., of N. Y., $30; I. A. G., of Mass., $30; T. G. Y., of N. Y., $30; O. D. W. of N. Y., $30; T. E. P., of ——, $55; J. M., of N. J., $25; F. B. N., of N. Y., $30; J. A. B., of Fla., $20; S. & G., of N. Y., $25; E. S., of La., $60; W. G., Jr., of N. Y., $100; Z. C., of Ill., $60; G. H., of Conn., $30; R. & R., of N. Y., $20; M. M. S., of Ill., $25; H. H. L., of R. I., $25; T. & S., of Pa., $25; E. B. of Mo., $30; H. S., of N. Y., $55; W. B., of N. J., $30; J. T., of N. H., $30; G. W. C., of Wis., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, May 22, 1858:—

J. C. B., of N. Y.; E. J., of Conn.; F. J. G., of N. C.; T. W., Jr., of Conn.; D. Y. C., of Pa.; W. H., of Ohio; G. W. R. S., of Va.; M. & T., of N. Y.; J. M., of N. J.; S. & G., of N. Y.; J. A. B., of Fla.; A. E. T., of Ohio; M. M. S., of Ill.; H. H. L., of R. I.; J. & H., of N. Y.; H. S., Jr., of N. Y.; W. B., of N. J.; S. B., of Ohio; F. C. K., of N. Y.; T. & S., of Pa.; R. T., of N. J.; H. D. W., of Mich.; S. P., of Mass.; E. B. W., of N. C.; Z. C., of Ill.; G. W. C., of Wis.

Literary Notices.

FOLLOWING THE DRUM. By Mrs. Veile. Rudd & Carleton, New York. This book is supposed to give the life of a young soldier of Uncle Sam on his frontiers, but instead of that it is simply a lady's handbook of travel. The authoress has been unable to enter into the spirit of a soldier, and has simply chronicled events as she saw them, which is from a very different point of view than that from which the young soldier would. The title is very unappropriate and the descriptions are weak.

THE LONDON QUARTERLY REVIEW for April. The first article in this number "The early life of Johnson" is truly rich, and the "Fictious of Bohemia" are graphic sketches of nomadic literary life, "Michael Angelo," "Public Speaking," "The Progress of English Agriculture," are some of the other essays, all brilliant and sparkling. Leonard Scott & Co., 79 Fulton street, New York, are the publishers.

THE CINCINNATUS. Edited by F. G. CARY. Published at Farmer's College, College Hill, Ohio. This is a valuable monthly compendium of useful information concerning agriculture and horticulture, education, and all things tending to the improvement of the rural taste. Its contributors are all men of excellence in their particular branches; and it is a remarkably good magazine.

THE ATLANTIC MONTHLY, for June, has a very fine article entitled "What are we Going to Make?" a synopsis and speculation concerning the ultimate fate of invention, and an explanation of the manner in which machinery will supersede labor. There are many other excellent articles.

TO OUR SUBSCRIBERS.

BACK NUMBERS—Complete sets of the present volume of the SCIENTIFIC AMERICAN can yet be furnished at the subscription price.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

RECEIPTS—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of the receipt of their funds. The Post Office law does not allow publishers to enclose receipts in the paper.

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. All advertisements must be paid for before inserting.

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WOODWORTH PLANING MACHINES, Mortising, Tenoning, and Sash Machines, and a full assortment of wood-working machinery, at greatly reduced prices. Address CHARLES H. SMITH, 135 North Third st., Philadelphia, Pa.

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A VALUABLE WORK—THE MECHANICAL PRINCIPLES OF ENGINEERING AND ARCHITECTURE. By Henry Moseley, M.A., F.R.S. First American, from the second London edition; with additions by D. H. Mahan, LL.D., U. S. Military Academy. With illustrations on wood. 8vo. pp. 700. $3 50. "This work is a standard one of its kind. It is fully and elegantly illustrated, and in its particular range is a complete manual for the engineer and architect."—[Railroad Journal. Copies mailed and prepaid on receipt of price. WILEY & HALSTED, 351 Broadway, New York.

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THE MECHANICS' GUIDE—CONTAINS Tables, Rules, Recipes, Hints, &c., useful to mechanics, farmers, and others. Sent free for ten cents. J. PHIN, Rochester, N. Y.

MACHINERY.—IF YOU WANT THE BEST Portable or Stationary Steam Engines, Woodworth's or Daniels' Planers, or any other kind of machinery for working wood for the least amount of money, address HARRISON FLINT, Danbury, Conn.

IMPORTANT TO INVENTORS.

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of twelve years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 128 Fulton street, New York. We have lately established a Branch Agency on the corner of F. and Seventh streets, Washington (opposite the United States Patent Office). This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices as Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agencies.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

Communications and remittances should be addressed to MUNN & COMPANY, No. 128 Fulton street, New York.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents:—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

TO CONTRACTORS—OFFICE OF CHIPPEwa Falls Lumbering Company, Chippewa Falls, Wis., April 24, 1858. Proposals will be received at this office until the first day of June next for building a Stone Dam across the falls of the Chippewa river, in town 28, North; range 8, West; said dam to be 700 to 800 feet long, and 16 feet high, and to be built in the most substantial and workmanlike manner, under the supervision of the President of the company; to be fitted with a slide about 20 feet wide, and long enough to allow lumber rafts to pass over in safety. The quantity of round timber to be used will be about 90,000 feet, running measure and will average 12@16 inches in diameter. All the necessary timber and plank will be furnished the contractor at the head of the Falls. The contract will be awarded on the 15th of June, and will be executed immediately afterwards. The work must commence on the 1st of July, or at as early a day previously as the water will permit, and must be completed by September 15th, subject to detention from high water. For the faithful performance of the contract, satisfactory security to the amount of $10,000 will be required on the execution of the same. Plans and specifications, and all necessary information will be furnished on application to J. F. JORDAN, 57 Randolph st., Chicago, Ill., or to JOHN JUDGE, Secretary, Chippewa Falls, Wis.

$500. WANTED—A RESPONSIBLE BUSIness man, to take an interest in a valuable patent for an improvement in Carpenter's Gages, by which one gage answers every purpose of two. Address Box 87, Brooklyn, N. Y.

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COPPERSMITH—JOHN H. CORNELL, No. 11 Old Slip, New York. Distilleries of all kinds, brewer's kettles, steam brewing apparatus, (McCracken's patent,) sugar kettles and trains, cane mills, mault mills, steam engines, boilers, &c. A small steam still for sale; runs 100 gallons in ten hours—95 over proof.

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We prefer them for family use.—[Tribune.]
They are the favorites for families.—[Times.]
It is without a rival.—[Scientific American.]
Equal to nine seamstresses.—[Home Journal.]
Most honorable to American genius.—[Independent.]
The machine, for family use.—[Advocate & Journal.]
Will give entire satisfaction.—[Observer.]
The best ever invented.—[Christian Inquirer.]
In looking for the best, see these.—[Examiner.]
Indispensable in every family.—[The Preacher.]

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WOODWORTH PLANERS—IRON FRAMES to plane 18 to 24 inches wide—at $90 to $110. For sale by S. C. HILLS, 12 Platt street New York.

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LAP-WELDED IRON BOILER TUBES—Prosser's Patent.—Every article necessary to drill the tube-plates and set the tubes in the best manner. THOS. PROSSER & SON, 28 Platt st., New York.

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VAIL'S SPEEDWELL IRON WORKS, Morristown, N. J., manufacture Craig's Patent Double-acting Balance Valve Oscillating Steam Engines both stationary and portable, Knowles' Patent Muley, Portable, Gang and Re-sawing Mills, Stone and Chilled Cane Mills and Sugar Pans, Grist Mills, Mill Irons, Rich's Water-wheels, Forgines and Castings. Orders for the above, and all descriptions of labor-saving machinery will receive prompt attention.

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CORLISS STEAM ENGINE CO., Providence, R. I.

PEA SHELLING MACHINE.—PATENTED by W. J. Stevenson, March 29, 1858. This machine is admirably adapted to the use of hotels, dining saloons, boarding houses, private families, pea growers, and pea preservers. State rights for sale. Address the patentee at No. 428 Third avenue, New York City. See engraving on page 34, Vol. XIII, SCIENTIFIC AMERICAN.

C. HECKMANN, MANUFACTURER OF MACHINERY—Of brass, copper, and iron wares, at Hamburg, Germany, recommends himself for the manufacture of steam boilers, Roberts' apparatus, machinery and apparatus for sugar refineries, breweries and distilleries, of the most approved constructions; also for the whole planning of any factory with drawings and mountings. All orders will be executed with promptness and on the cheapest terms. Inquiries must be made prepaid.

FOR SALE—RIGHTS IN TWO PATENTS FOR Steam Engine improvements, being a valuable variable cut-off, and practical direct connection of piston rods with crank, effecting great saving in construction and first cost. Interests given to capitalists. Inquire of B. ACKERMANN, 710 Broadway, New York.

PATENT OFFICE MODELS CAREFULLY made on scientific principles, at low prices, by H. SHLARBAUM & CO., 360 Broadway, New York. References at the office of this paper.

ANOTHER WONDER—BALDWIN'S TURbine Water Wheel (represented in No. 51, Volume XII, Sci. Am.) gives from 75 to 97 per cent of power, according to the size of wheel and head employed. Usual sizes, with 4 to 25 feet fall, give 80 to 90 per cent. For information address S. K. BALDWIN, Laconia, N. H.

Science and Art.

Effects of Various Illuminating Materials in Vitiating the Air.

It has been found by experiment that lights of the same intensity from different substances take different periods to vitiate the same quantity of air, by converting it into carbonic acid. Rape oil, 71 minutes; olive oil, 72; Russian tallow, 75; common tallow, 76; sperm oil, 76; stearic acid, 77; wax candles, 79; spermaceti candles, 83; common coal gas, 98; cannel coal gas, 152. Thus the cannel coal gas is proved to be the most healthy to burn.

The Use of Gold.

The Times, of Hamilton, C. W., publishes a paragraph headed "To the West.—Gold!" and proceeds to give some wonderful particulars furnished them by a gentleman from Adrian, Mich., concerning the great quantity of gold which is found in the quartz of that neighborhood. The sands of the Missouri river, it informs us, are full of gold; and the postmaster of Osceola, Iowa, says that "the gold excitement is very high here. There is a company with fifty hands at work, all expecting plenty of the precious metal."

From this information it would seem as though a gold excitement was to be got up out West, and that some land speculators were trying, by false representations, to induce emigration to their territory. Now we believe in genuine, solid progress. We believe that land, as land, capable of cultivation, is worth more, practically, for the advancement of civilization than the gold mines of Peru or the diamond mines of Golconda. That there may be gold there we do not doubt, because, although the most precious, it is the most diffused of all metals; but the mere presence of gold is not wealth. In many instances, we may say in the majority, the presence of gold is poverty, for it often costs one dollar and a half to extract a dollar's worth of gold from a piece of quartz. California has gold enough for us at present, and therefore, those who have any idea of going West should be prepared "to dig, to sow, to reap, to mow," rather than to search after gold, for in a new country it is of no use, and is not for one moment to be placed in the scale with the honest hand and head labor of a man.

Improved Slide Valve for Steam Engines.

This capital contrivance for admitting the steam to the ends of the cylinder, and exhausting the same therefrom, consists in constructing the valve so as to enable the steam to be admitted through the stem on which it oscillates and through its body, and to be exhausted by simply exposing the openings alternately, thereby producing a perfectly balanced and highly simplified valve.

In our engraving, Fig. 1 represents a vertical section through the center of the valve and steam oscillating cylinder; Fig. 2 is a view of the circular face plate and cylinder, and Fig. 3 is a view of the face of the valve which oscillates over the same.

A represents an oscillating steam cylinder, supported on suitable bearings, and having a circular face with two openings, B C, as shown in Fig. 2, communicating by steam channels with the front and back ends of the cylinder respectively. D is the exhaust steam chest furnished with a stuffing-box, E, through which the stem of the valve, F′, passes. This stem is hollow, and communicates at one end with the steam pipe, G, and the steam passage within it is diverted from its straight course at its end through the valve, so as to open upon the face of the same on the same circle that the openings, B C, are situated, said valve face being kept against the circular face, I, of the cylinder, L, by a set screw, H. I is a crank secured by a bar or hub to the valve stem, and connected by a rod to the ordinary eccentric on the main crank shaft of the engine. K is the escape pipe. When the steam is admitted to the valve, F′, it is caused to pass through the stem, and divergent opening in the body of the same, and to be alternately admitted, with the respective oscillations of the valve, into the steam passages communicating with the ends of the cylinder, and to be exhausted therefrom in the same alternate manner by the exposure of the openings in the circular face of the cylinder, the respective oscillations of the steam cylinder

SCOTT'S IMPROVED VALVE.

Fig. 1

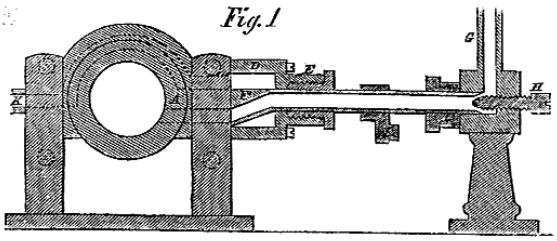


Fig. 2

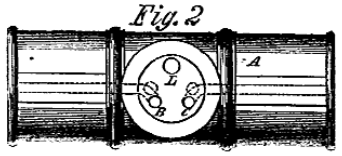
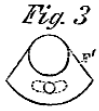


Fig. 3



and valve being in reverse directions, and the extent of the movements of the two being sufficient to produce this effect. The cylinder may be made stationary, and the valve can have a revolving motion over the face of the cylinder if desired, in which case the openings in said face will be made opposite each other, and the outlet opening extended in length as represented in dotted lines in Figs. 2 and 3, for giving the cut-off to the steam.

This is an extremely simple and durable valve, economizing greatly in friction, and not liable to get out of order. It was patented on the 27th af April, 1858. Any further information on the subject can be had by addressing the inventor, Thomas Scott, New York, up to the 1st of July, and after that period at San Francisco, Cal.

STEPHEN'S IMPROVED CARPENTER'S RULE.

Fig. 1

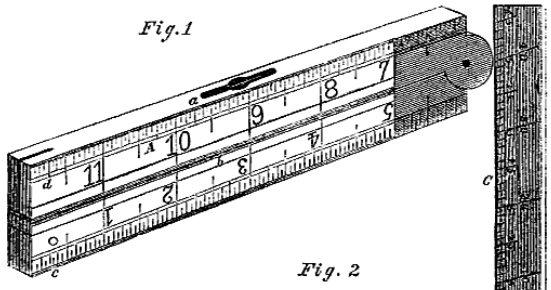


Fig. 2

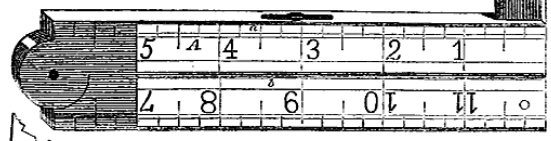
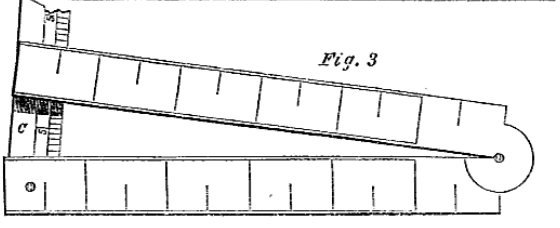


Fig. 3



Our engravings illustrate an improved carpenter's rule, invented by L. C. Stephens, of Pine Meadows, Conn., and patented by him January 12, 1858, that combines in itself a spirit level, square, plumb, bevel, and indicator, all of which parts, in their separate application, being perfectly reliable. It is made of boxwood, with one joint, as seen in Fig. 1, and bound with brass for protection.

When in the position shown in Fig. 1 it acts as a spirit level; the limbs, A *b*, being true, the bevel of anything can be adjusted by the spirit level, *a*. At *c* there is hinged a thin piece or blade that folds into the lower limb, *b*, and this being raised, and A closed over it, so that a slit in the end of A at *d*, holds it secure, a square is made, as seen in Fig. 2. Under the blade an eccentric is inserted, which binds upon the under side of the blade, and is to be used in adjusting the square, should it wear so as to require it. When the rule is fixed as a square the level shows the horizontal position, and, of course, the blade is a plumb. The blade is marked in angles, so that when the leg, A, is opened, and the blade placed at any angle, the rule becomes a bevel, as seen in Fig. 3.

One side of the blade is graduated into sixteenths of an inch, and the other into degrees, and numbered 5, 10, 15, to 45. The carpenter requires an angle, say, of 40°; he raises the leg which contains the tube to 40, then brings it to a level, and the lower leg indicates the degree precisely. The 12-inch rule is of the same weight as an ordinary fourfold, full bound rule, and occupies the same space.

By the use of one of these, a builder, mason, carpenter, or other workman, can always have in his pocket the most valuable of his apparatus used in construction, combined in a portable, useful, and cheap form.

The inventor will furnish any further information upon being addressed as above.

Hame Tug Fastener.

This is a highly useful contrivance for attaching the traces or tugs of harness to the hame without the use of buckles. The fastening is so arranged as to be self-acting; the forward movement of the animal locks and keeps the tug and hame locked together. It was patented this week by the inventor, E. D. Lockwood, of Churchville, N. Y., and the claim will be found on another page.

A Suggestion Worthy of Note.—We are now engaged quite extensively in making examinations at the Patent Office into the novelty of inventions preliminary to an application for a patent. If an inventor has an improvement upon which he desires to secure Letters Patent, and has doubts in regard to its patentability, he is advised to send us a sketch and description of it for examination. If he wishes the Patent Office to be searched beforehand, the fee for this service ($5) must also be remitted, which ensures a careful examination and a full report. It is scarcely necessary, after an experience of ten years, that we should state that all such communications are regarded as strictly confidential. Circulars of information sent free.

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